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Ornithology



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W.K.P.

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Hushon, L. R.



THE CONDOR, January, 1929

ARAMIDES VANROSSEMI, sp. nov. EL SALVADOR WOOD RAIL



THE CONDOR

A BI-MONTHLY MAGAZINE OF
WESTERN ORNITHOLOGY

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COOPER ORNITHOLOGICAL CLUB

VOLUME XXXI

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NESTING OF THE SNOWY OWL

WITH EIGHT ILLUSTRATIONS

By O. J. MURIE

In the course of an expedition, undertaken in the summer of 1924 jointly by the Bureau of Biological Survey, Mr. H. W. Brandt, of Cleveland, and Mr. H. B. Conover, of Chicago, to the Hooper Bay region near the mouth of the Yukon River, Alaska, one of the most interesting birds observed was the Snowy Owl (*Nyctea nyctea*). The following notes will give at least a portion of the life story of this Arctic species. Photographs are used through the courtesy of the Biological Survey.

Our headquarters were established at the Bureau of Education schoolhouse near the shore of Hooper Bay, giving us access to the rolling tundra extending inland, as well as to the tidal marshes bordering the bay. To the northward lies Igiak Bay, a smaller body of water also bordered with tide flats. The Askinuk Mountain range extends along the north side of Igiak Bay, projecting into Bering Sea and forming Cape Romanzof, thus adding to the variety of elements constituting the fauna of the region.

Our numerous tasks in this area of abundant and varied bird life prevented a thorough study of the snowy owl. Even though a complete record was not obtained, abundant scattered observations revealed a number of interesting facts in the nesting life of this owl. About forty nests were observed, a few of which were visited repeatedly in an effort to learn something of the bird's food habits and the sequence of events in its nesting.

The Nest. The snowy owl nested most abundantly on the high rolling tundra, but a certain number were found on the tide flats and others on the slopes of the Askinuk Mountains. In nearly all cases the birds chose a hummock for the nesting site. In a few instances a large hummock, rising prominently to a height of three or four feet, was selected, but ordinarily the nest was made on a less conspicuous rise, sometimes a very slight one. Often there were numerous other hummocks in the vicinity, many of them better defined and drier than the one containing the nest. On the high tundra, as well as on the tide flats, small lakes were plentiful, and the nests were consequently located near some body of water or marshy tract, usually on a long gentle slope. They were seldom found on the highest elevations. In the Askinuk Mountains nests were found on various parts of the slopes, one at least at an elevation of approximately 1000 feet. Other nests were seen on the salt-water marsh, which was partly inclosed by two spurs of the mountains.

The nest was merely a hollow scooped out of the top of the mossy knoll or mound, usually exposing the peaty earth underneath the vegetation. Normally there was no lining, but in a few instances moss, lichens, or grass was present in the nest. This had been plucked near the nest rim. One nest had been made on a small mound capped with tall grass. The owls had torn out enough of the grass to make room for the nest and had left the rest standing.



Fig. 1. NEST AND EGGS OF SNOWY OWL ON A GRASSY HUMMOCK
NEAR HOOPER BAY, ALASKA, JULY 6, 1924.

In the Askinuk Range, three nests were found on huge granite boulders about four feet high and capped with moss and other vegetation in which the nest cavities had been scooped out. One nest was near the base of a slope, the other two at a much higher elevation on the upper slopes. Sometimes a second nest was found near the one occupied. One such nest consisted of a well-formed cavity; another had been started only. These were evidently false beginnings, abandoned when the owls had decided on a new location.

The nest cavity varied from 11 to 14 inches in diameter, the average being about 12 inches. The depth varied from $2\frac{1}{2}$ to $4\frac{1}{2}$ inches. The longer the nest was occupied the wider and flatter became the cavity. As the young hatched and grew the nest became littered with mouse fur, bird bones, and feathers (including owl feathers). Thus the nest with this accumulation in many cases became a mere platform for the



Fig. 2. BROODING FEMALE SNOWY OWL; PHOTOGRAPHED NEAR HOOPER BAY, ALASKA, MAY 29, 1924.

young until they were old enough to scramble out and crouch in the grass near by.

Nesting Habits. The nest of the snowy owl is easily found. The male is usually perched in a conspicuous position, and his white plumage can be seen at a great distance. When the bird is approached he will shift his position repeatedly, going farther and farther away; but usually the female may be observed leaving the nest, somewhere in the vicinity. If she escapes unobserved the nest may be located by the tell-tale white feathers that accumulate in and about it. When I approached a nest

closely, the male rushed to the attack and with a series of hoarse, barking hoots swooped at me repeatedly. This was often a vigorous demonstration, but as a rule the bird did not appear likely to strike and never did make a real attack. In a few cases the male persisted in this demonstration but generally lost some of his aggressiveness after a few minutes and would sail off to some convenient perch. The female was more timid. She sometimes joined in the outcry at a distance in a somewhat higher-pitched tone, but held aloof and did not attempt to intimidate the intruder.

There were individual differences of behavior among the birds, one extreme represented by a pair that appeared indifferent, in fact so wary that for a time I was uncertain as to their connection with the nest I found. The other extreme was illustrated when, at another nest, the male swooped so determinedly that I thought it



Fig. 3. NEWLY HATCHED SNOWY OWL, STILL WET, WITH ANOTHER A LITTLE OLDER; PHOTOGRAPHED JUNE 26, 1924.

was to be a real attack. When a nest had been under observation for some time and was visited repeatedly, the birds became accustomed to the intrusion and the customary initial outcry became rather perfunctory. In one case the mother returned to the nest many times, although the camera stood near by and I lay in view a little farther away prepared to pull the thread releasing the shutter. Finally she returned to the nest, while I sat with the camera within easy range.

In two instances both male and female fluttered over the ground, simulating injury, in an effort to decoy me away. This practice apparently was not universal among the snowy owls, and was used only briefly by the two pairs noted. Evidently a threat is more in keeping with snowy owl nature.

A curious reaction was sometimes exhibited. When I approached the nest the birds would raise an outcry as usual. Then, when the male chanced to fly by the female, which was sitting on the ground, he dropped to her side and mounted in the posture

of copulation, remaining so about ten seconds. Three different males performed in this manner, a striking example of confusion of instinctive responses.

One day a light rain was falling as I approached a nest. The mother bird flew away but soon returned to her eggs for a moment, although I was still walking toward her. On reaching the nest I found a few bits of moss on the eggs. Presumably the moss had been placed there accidentally, but there is the possibility of an imperfectly developed instinct to cover the eggs, in the face of an approaching enemy or rain. Her anxiety over the circumstances was evident from the fact that she did return to the nest even though I was steadily coming nearer. Her actions recalled a similar incident, when a female Steller eider climbed out on the shore of a pond when it began to rain, covered her eggs thoroughly, and then walked back into the water, while I stood within a few feet of the nest, photographing it.



Fig. 4. SNOWY OWLET JUST HATCHING; PHOTOGRAPHED JULY 6, 1924.

The sexes were easily distinguished at a distance. The males appeared immaculate, while the females were heavily barred. The males that were collected proved to have a few dark markings, but these were not apparent in life.

Division of labor between the sexes was clear cut. The female incubated the eggs, the male usually standing guard at a distance. I do not recall an instance when this arrangement did not prevail. Presumably the male did most of the hunting, and I believe fed his mate, to some extent at least. When the young were hatched it was the female that fed them, although the male probably furnished the food. Her face and breast were usually bloody and bedraggled as a result of her duties at the nest, while the male's plumage was clean.

Incubation. From 5 to 10 eggs are laid, averaging 8. The majority of nests examined contained 7 or 8 eggs. An egg is laid every other day in most cases, and they hatch in the same order, although there are definite exceptions to this rule. I wished

to collect several sets, and to prevent the first-laid eggs from hatching before the last one was laid I drilled holes in several and stirred the contents with a straw, hoping this would in some way arrest development. I was delayed in returning to some of these nests and found, when I did return, that all had hatched in spite of my tampering.

I found the first nest, with 2 eggs, on May 24. On the next day three more nests were found, containing 1, 3, and 5 eggs, and on May 29 three additional nests with 6, 4, and 2 eggs. Nesting was in full progress at this time. As late as June 4 a nest was found containing a single egg, probably a second laying, for the Eskimos were in the habit of gathering the eggs for food. If one judges by the nest contents and the rate of laying, egg-laying may be said to begin about May 20. The eggs varied considerably in size, even within the same set.

As nearly as could be determined the incubation period is about 32 days.



Fig. 5. SNOWY OWLETS OF SEVERAL SIZES, ONE BROOD; ONE EGG REMAINS; PHOTOGRAPHED JUNE 27, 1924.

The Young. On June 20, I found 2 eggs hatched in one nest, and from that time on, eggs were hatching regularly in the nests under observation. This was a prolonged process, however, for incubation had begun when the first egg was laid. Consequently, when the last white downy chick appeared, the first comer, sometimes two weeks his senior, had already grown to many times the size of the little one and had acquired the blue-gray downy plumage. The other nestlings furnished all the intermediate steps of the series in age and size.

I did not obtain a complete story of the growth of the young, but a few disconnected observations will indicate roughly the sequence of events in their development. A newly hatched young is covered with white down. The skin is mainly pink, with pink also on the feet and toes, and gray on the claws. The skin about the eyes and ears is blue; cere, flesh color; bill, pale blue-gray, with a slight suffusion of flesh tint.

Later, when pin feathers are appearing, the cere has become blue-gray, although still lighter than the bill. The claws have become more decidedly blue-gray, with light tips.

By the time the last egg was hatching in the average nest some of the older young were clothed in long blue-gray down. On July 10, I found several in the gray plumage with primaries just appearing. On July 14 another showed the primaries and on July 15, in a brood of seven, the two oldest were still farther advanced in this respect. We left the region too soon to see the first full plumage.

A young bird's eyes are not opened for a number of days after hatching. On June 27 a nest contained a pipped egg and four downy young. Three of these had opened the eyes very slightly, probably not enough for vision. The youngest kept the eyes



Fig. 6. YOUNG SNOWY OWL IN THE BLUE-GRAY DOWNY STAGE; PHOTOGRAPHED JULY 6, 1924.

closed. In a nest of five young and one pipped egg, the oldest one had opened its eyes enough to show clearly their color, which at that age is pale yellowish. At a somewhat earlier age the eyes are "pale yellowish clay color," as described in my note book.

Mortality. I was surprised to find a high mortality among the young. Most of the broods numbering 7 or 8 were eventually reduced to 4 or 5, while some were still further decimated. The factors involved are hard to determine, but a number of observations are suggestive. By the middle of July rains had set in and prevailed during the remainder of the season. During the rainy spells I found downy young, in the gray plumage, crouching in the grass, wet and bedraggled. They leave the nest when old enough to scramble about easily and can not then be sheltered by the parents. On July 6, in one nest that had been under observation, only one live bird remained

and near-by lay two others, dead. On July 15 at another nest the youngest owlet, soaked by rain, was dying. In the first instance feathers of a jaeger (probably *Stercorarius parasiticus*) were scattered near the nest. The owl may have killed one for food, but it is also possible that the jaeger had attempted to rifle the nest in the owner's absence and had been caught redhanded. Earlier in the season, on May 29, a nest was robbed by jaegers. One egg had been eaten and two or three others punctured, leaving an imprint of the jaeger's bill. No doubt the robbery had been interrupted by one of the parents. These particular owls were very timid and remained away from the nest so long and so far that it was difficult at first to decide whether the nest belonged to them. My own disturbance of this pair no doubt furnished the opportunity for the jaeger.

Probably several factors combine to reduce the numbers of the owl nestlings, ap-



Fig. 7. IMMATURE SNOWY OWL; BLUE-GRAY DOWN PREDOMINATING, BUT TRUE FEATHERS COMING IN; PHOTO TAKEN JULY 31, 1924.

parently a reduction of nearly 50 per cent in this case, although my data are not sufficient for a comprehensive statement. No doubt jaegers are able to obtain a few eggs, possibly also an occasional young bird, but I do not believe they constitute a big factor. It is likely that the drenching and chilling by rain have a greater effect, picking off the younger members of the family that lag so far behind their brothers and sisters in growth. Sometimes the young birds were found crouching in crevices in the earth and other natural shelters, and it was evident that the stronger ones, at least, were surviving the cold rain. Seasons vary and may have much to do with the fluctuation in the snowy owl population. The large number of eggs laid plays an important role in counteracting the mortality of the young.

Food. The food of the snowy owl varied with the character of the nesting ground. Those on the marsh in the immediate vicinity of great numbers of nesting

water-birds fed extensively on birds, both old and young. Others, nesting on drier ground farther from the concentration of waterfowl, maintained throughout the season a diet consisting almost exclusively of mice. In marshy areas remains of young emperor geese and cackling geese and adult old-squaws, eiders, and other ducks, were found. I have no record of adult geese having been killed. A pair of emperor geese built their nest in the margin of a pond, not more than 50 yards from the nest of a pair of snowy owls. One goose incubated the eggs, and I frequently saw its mate swimming near by. A pair of glaucous gulls nested on an island in the same pond. The owls evidently did not molest them. The geese hatched out their young and left the vicinity, after which I did not have them under observation.



Fig. 8. FIVE YOUNG SNOWY OWLS IN BLUE-GRAY DOWN, HUDDLED TOGETHER IN THEIR NEST DURING STRONG WIND; PHOTO TAKEN JULY 6, 1924.

On July 14 a number of young cackling geese were banded. Later in the day remains of two of these were found at an owl's nest. In this case our own activities, disturbing the geese, may have been partly responsible. One owl had killed a short-billed gull. Several nests contained remains of ptarmigan. At one nest, among ptarmigan feathers and parts of old-squaws, were remains of a short-eared owl. On another occasion I found a short-eared owl with the head eaten. Throughout the marshy areas, in addition to the birds, the snowy owls caught many mice, including *Dicrostonyx*, *Lemmus*, and *Microtus*. The debris accumulating about the nest, a great mass of disintegrating pellets, was a good indication of the snowy owl's food habits. As the season advanced, such accumulation became extensive. In some instances this consisted largely of feathers and bird bones, but usually there was a strong foundation of mouse

fur, and in some cases practically the whole structure was mouse fur. From one to five mice were sometimes found at the nest.

In the Askinuk Range, above the nesting places of waterfowl, the owls fed almost exclusively on mice, although a few rock ptarmigan were obtained there.

All this indicates that the snowy owl feeds on whatever happens to be most abundant within easy reach of its nest. The relative abundance of birds and mice no doubt affects its menu. It was surprising to find no evidence that adult geese are killed, although three species nested plentifully in that district. It was also not to be expected that in areas where nesting birds were concentrated mice would still be an important item of food. If mice had been scarce this would not, of course, be the case.

The season of 1924 may have been unusual, and we were very fortunate to have this opportunity to observe, in such numbers, this bird of the far north.

Bureau of Biological Survey, Washington, D. C., June 6, 1928.

THE FORTUNES OF A PAIR OF BELL VIREOS

By MARGARET MORSE NICE

The Bell Vireo is by far the commonest of its family in the vicinity of Norman, Oklahoma; the Red-eye nests only in tall trees in woods, the Warbling is very local, having been found by us in but three places in Cleveland County, while the White-eye is rare, nesting only occasionally and then in thickets on the edges of woods. *Vireo bellii bellii* is preëminently a bird of shrubbery; it frequents the clumps of sand plums and young willows, and also adapts itself to civilization and nests in gardens.

The Song. There is no music to the Bell Vireo's refrain, but it possesses a quaint charm in its air of enthusiasm, the rapid jumble of it all. It may be phrased *whillowee*, *whillowee*, *wee* or *jiggledy*, *jiggledy*, *jee*. There are four possible variations: there may be three *whillowee*'s instead of two, and either song may end with a rising or a falling inflection. These four songs are sung in no particular order, as the following record of a series taken August 10 shows (2r meaning two main phrases ending with a rising inflection, 3f meaning three main phrases with a falling inflection, etc.): 2r, 2f, 3f, 3r, 2f, 3r, 3f, 3r, 3r, 3r, 3r, 3r, 3f, 2f, 2f, 3r, 3r, 3f.

When the bird is thoroughly in the mood, his rate is a song every three seconds, about one and a half seconds for the song and the same for pause. He does not, however, sing with the regularity that many birds do, for this rapid rate is seldom kept up as long as a minute, 15, 16 and 17 songs a minute being the highest numbers I have recorded, while 8 to 12 are more commonly heard. As for hour records, a nesting bird sang the following number of times: 32, 56, 57, 61, 70, 99, 131 and 254. Bell Vireos seem to sing all day long and all summer long; they are heard through August with diminished fervor and well into September, the last songs having been recorded on the following dates: September 13, 1920, September 18, 1921, September 9, 1922, September 11, 1923, September 20, 1925, September 21, 1926.

On September 6, 1925, I noted: "The Bell Vireo sings a little each morning. One day we saw him eating berries of black alder, in the meantime singing his regular *jiggledy jiggledy jee*; he also had a scolding kind of song—*zip zip zip zip zip zee*. Sometimes this was preliminary to the ordinary song, sometimes not." On September 19: "The Bell Vireo gave a few explosive song and scold mixtures."

The scold, *chee chee chee chee*, is a most expressive utterance, given by both male and female. A sputtering *spee spee*, heard from the male during nest building, appeared to be a courting note. The juvenile call note is a single, nasal *pink*. A cuckoo-like *kuk kuk kuk kuk kuk* was heard August 12, and a loud *unk* on July 10; the significance of these notes is unknown.

The First Nest. In 1926, I followed the fortunes of a pair of Bell Vireos for two months on the campus of the University of Oklahoma. On May 12, I heard ecstatic singing in a honey-suckle bush; upon investigation I discovered an exquisite little nest only 15 inches from the ground; in it was one egg. The nest was largely made of birch bark (from an introduced tree near-by); spider webs, cocoons and bark fibres were on the outside, while fine pieces of peppergrass stems and horse hair served as lining. By May 15 there were four eggs; three of these hatched May 28, the last, May 29; hence, incubation must have started with the third egg and lasted 14 days.

On May 29, I watched the nest from 10:23 to 10:53, seated 25 feet to the east. The female flew off at my approach but returned in three minutes, brooding the young as long as I stayed. The male made 8 trips to the nest with insects, giving them to his mate who opened her bill very wide to receive them. He sang 19 songs, all away from the home bush.

Two days later I watched from 10:40 to 11:40 A. M. No parent was in sight at first, but both came to the nest at 10:45, feeding the young side by side. The female then settled down and brooded for 25 minutes; the male in the meantime busying himself, bringing food and singing. He greatly disliked my field glasses, scolding and hurrying away whenever I used them. During the hour, he fed 11 times, and his mate, 5; he sang 21 times in the home bush and 11 times elsewhere. While both parents were away I bent back some twigs so as to get a better view of the nest; they did not seem to mind this temporary change in the surroundings of their home. The female brooded again from 11:30 to 11:40, when I frightened her away by unbending the twigs. At 11:32 she ate the food brought her, but four minutes later she passed it on to an infant. The male nearly always announced his identity by his song, but sometimes I knew it was he because he objected to the glasses far more than did his mate.

The next day I moved my stool to within 15 feet of the nest and no longer had to use the alarming glasses; the birds objected very little. The female was brooding at the beginning and end of the hour (8:50 to 9:50), and also from 9:09 to 9:21—25 minutes in all; I had to frighten her away to fix the branches for better observation, and later to replace them. The male brooded once for about a minute, ruffled up and scolding; he left at the approach of his mate. The female fed three times, the male five; twice he gave the food to her, once she ate it herself and once gave it to the young. Fifty-five songs were given in the home bush, 15 elsewhere.

On June 2 the female failed to appear for 17 minutes, then she was so displeased with my proximity (I had now moved to within 10 feet) that she ate her caterpillar herself, scolded and scolded, flirited her tail and hopped about in the bush. Two minutes later, however, she and her mate were both on the nest rim; she fed the young, and he gave his insect to her, whereupon she *ate it herself* and flew away. In 15 minutes she returned with a green caterpillar which she presented to the young; she took an anal sac and carried it away. The two days previous each parent had eaten a sac once during the observation hour; from now on both carried them away consistently. There was no brooding today, yet the female fed only four times during the hour, while the male did so 12 times. In order to avoid the sun I moved within 8 feet of the nest; the male accepted me as harmless, but his mate was quite apt to disapprove; hence I distinguished her by her propensity to scold, him by his irrepressible tendency to sing. There were 37 songs in the home bush and 24 others during this period.

Two hours, 8:30 to 10:30, were spent at the nest on June 3, when the young were five and six days old; there had been a heavy rain in the night and the day was decidedly cooler than any of the previous ones—66°F in contrast to 75° and 87°. Consequently there was some brooding, four times by the female, twice by the male; her broodings lasted one minute, four minutes, twenty-nine and ten; his, one minute, and seven minutes. He always left at her approach, she did so at his, three times. She fed 9 times and removed excreta three times. He brought 18 meals, carried off four anal sacs, and gave 63 songs in the honeysuckle and 124 elsewhere.

Once he came to the nest, fed, picked up lice and then stood for two minutes on the nest rim, after which he popped down to brood. Unfortunately his mate came in about a minute and he slipped off. The female spent a good deal of energy in scolding me while she was on the nest; when most displeased she uttered two scolds a second, but often calmed down to about one call a second and at times would stop. A curious incident took place while she was brooding: the male gave her a green caterpillar which she merely held in her bill while she scolded. Six minutes later he reappeared with a large insect, but her mouth was already full; he ran his offering

along her bill but in vain, for she remained perfectly quiet. He seemed at a loss what to do, then with some difficulty rearranged the creature in his bill and swallowed it himself. After his departure, his mate rose and gave the caterpillar to her family; she inspected, settle down again and began to scold once more.

During her last session of brooding, the male, singing twice in the home bush, gave her a small green caterpillar; she fed this to the young and then started to scold; he gave a farewell song, left, sang once to the north, but the next minute was back in the bush singing. He gave her another insect, she went about a foot from the nest, he left, she returned and fed the young, then flew away herself. It was astonishing how he could sing while holding large creatures in his bill.

When approaching the nest both birds invariably alighted in the top of the bush and descended by easy stages, their soft colors blending beautifully with the lights and shadows on the leaves. They always stood on the north rim to feed and inspect except when both birds were present at the same time; then they stood on the east side. Until the last day, the female faced south when brooding; on June 3, she faced in all three other directions; the male faced north and northeast. Inspection was often a rather prolonged process, especially with the male; the two occasions on which I timed him, it lasted 45 seconds and two minutes. Four times I noted him apparently pecking at lice, but I did not see his mate in this act.

As to the food, with one possible exception, only one piece seemed to be brought at a time. Green caterpillars were the favorite objects, since 19 of these were brought; twice there were moths. Larger objects were brought on June 3 than before. The male gave 25 of his 54 feedings to his mate; since I did not fasten back the twigs around the nest until the middle of the second day of observation, I could not see what was done with 15 of these meals, but of the ten others, four were eaten by her and six passed on to the young.

We had to leave, June 4, for the Wild Life Conference at the Wichita National Forest; on our return, the 8th, I found the nest had been torn out and there were no signs of the young nor of the parents; this misfortune probably happened the night of the 3rd or 4th.

The Second Nest. On June 10, I located the new nest of this pair, 75 yards to the east in a hydrangea bush, much better situated than its predecessor for observation, because of the shade available all morning long. I hoped to be able to make a good study of their nest life this time. It looked as if the little birds might have learned a lesson, for this nest was three feet from the ground. It was a beautiful little thing largely made of birch bark. The male sang a great deal in the home bush, and a little in another bush. Once he dashed back to the hydrangea to drive away a Brown Thrasher; I heard a scuffling but could not see what took place. Their first home was in an isolated shrub and had had no bird visitors while I watched, but this, on the contrary, was in a row of bushes. On June 11, there was one egg, on the 14th four and the female was incubating, sitting quietly for 27 minutes of the half hour I watched, her mate singing 20 times in the home bush and six near-by.

On June 22, I watched the nest from 9:32 to 10:32, the female leaving her post as I arrived 20 feet away; I moved my stool within 15 feet and waited. Four minutes later I heard scolding in the home bush, then four songs; a parent came to the nest, inspected and settled down to brood. At 9:15, I was astonished and delighted to hear a song from the nest. The absurd little bird apparently couldn't keep quiet any longer and had to sing even in the situation which above all would seem to call for quiet. He wriggled around, ate a louse, sang again and again. He seemed to be a more restless sitter than his mate. At 10:17, after he had sung 30 times from the nest, the female

returned; he greeted her with a song and left the nest, singing once more; she scolded, came to the nest, got on, stepped off, scolded again, but after that settled down to incubate quietly. During this hour there had been 36 songs in the hydrangea and 21 from other shrubs.

On June 25, I found that the cat, besides emptying the neighboring Mourning Dove nests, had torn the bottom out of this little home.

The Third Nest. The next day I discovered that the foolish little birds had returned to their first bush and had started a nest three feet from the ground; there was material on the two supporting twigs only. I watched from 8:44 to 9:44, at first from a distance of 20 feet, later from 15. The male was in the highest of spirits, singing far more than during any of the other periods of observation, for he gave 125 songs in the home bush and 129 elsewhere. He also had a new note—something between the song and scold, *spee spee*, with which he greeted his mate. The female was the chief architect; she made seven trips, but only twice could I see material in her bill. The male came 16 times, as if he had to be always examining the structure, but I never saw anything in his bill (I have seen other male Bell Vireos carrying material). As formerly in the brooding and incubating, he acted as if his mate had prior right to the nest and always hurried away when she came. I could not make out whether he was helping or hindering, but he certainly was vastly interested in the enterprise and was always coming to tinker with it. At the end of the hour, threads had been pulled straight across from side to side.

Most of the work on the nest was apparently done that day or early in the morning of the next, for at 9:00 on June 27 it was practically all there, although not shaped at the bottom. Enthusiasm was decidedly less on that day; for each bird made but four trips in the hour, and the male sang only 99 times (31 in the honeysuckle). At 9:14 the female came to the bush with an inch-long piece of birch bark; the male went to the nest and pecked a little; she came, he sputtered and left, singing seven songs in the home bush. She stood on the rim, arranging her piece of bark, pecking and pecking, then she settled down into the nest. Her mate came near, she flew off and he followed. The next two times they came together, the female getting into the nest and turning around and around. At 9:35 he arrived alone and started to work with the fibres, teasing and stretching them, getting down into the nest and working most busily, in the meantime singing. His mate arrived above him, waited a moment until he noticed her, when he hurried off, saying *spee spee*.

On June 28 the nest looked somewhat nearer completion. At 5:00 A. M., June 29, it was all done but the lining. The next day at 8:40 it seemed entirely finished; the male was singing and sputtering in the vicinity. On July 1 at 7:00 P. M. it looked as if a little more lining had been added. On July 2, I found the male admiring the first egg. Three days later the third disaster had taken place; the nest was upside down on the ground with two tiny white eggs and a Cowbird's near-by. The nest had been made largely of birch bark and wool (from the sheep pen a few yards away), lined with peppergrass stems and horse hair; a few cocoons had also been used.

The male was singing quite a little, often in his home bush. From July 6 to 9, I heard him to some extent, but found no evidences of building. On the 10th there was no singing but some queer new notes that sounded like *unk*. The bird came into a tree and gave a squeaky, scolding series something on the order of the song and then sat with bill wide open for several minutes. After that it sat perfectly quiet in the tree for 15 to 20 minutes, not making a sound or movement; finally I left.

The birds were not seen nor heard again. I do not know whether they had the courage to try again elsewhere after three tragedies, or whether they gave up entirely.

Summary of Nesting Activities. The meals were brought at a rapid rate, once every 4.9 minutes during five and a half hours of watching. To be sure, some of these 75 meals, at least five and perhaps a dozen, went into the female's crop, so that the young received food once every five minutes on an average, or three times an hour for each little bird. The male fed 54 times, the female 21.

The average duration of brooding was 13 minutes on the part of the female and three for the male. Both parents ate the feces the third and fourth days and carried them away after that, the female disposing of seven in the five hours, the male of eight.

It is clear from the singing indulged in that the male was at the height of his enthusiasm on the first day of building the nest, giving on an average 4.2 songs a minute during the hour; the next day he sang about a third as much, that is, 1.5 songs a minute. As for his singing while feeding the young, during the first two days when the temperature reached 87° and 85° the rate was the lowest of all, 0.6 and 0.5 songs a minute; during the next two days when the temperature had dropped 10 degrees the rate was doubled, 1.1 and 1; while the last day, when there had been another 10 degree fall, the rate was three times as rapid as during the two hot days. It looks as if with this bird there is a definite increase in energy available for singing during cooler weather. However, the last three periods of observation were earlier in the morning than the first two; with most birds there is a decrease in singing zeal towards the middle of the day, independent of increase in temperature. Vireos are supposed to be exceptions to this rule, but I do not know that the matter has ever been tested carefully.

In the nine hours of observation the male sang 388 songs in his home bush and 417 elsewhere.

In this fragmentary study of the home life of a pair of Bell Vireos, the enthusiasm of the male throughout the cycle was delightful to witness—his intense interest in nest building, his exuberance while incubating, and his devotion to the young both in occasionally brooding them and in assuming the major part of the task of feeding them.

Further Data on the Bell Vireo. This bird is a summer resident in northeastern and central Oklahoma, being found in the southwest occasionally in Comanche and Tillman counties and in the northwest in Woodward County. At Norman, in the center of the state, its dates of first arrival have been as follows: April 28, 1920; April 25, 1921; April 27, 1922; April 29, 1923; May 2, 1924; April 30, 1926; April 28, 1927; the average of the eight years being April 28. In northeastern Oklahoma it comes earlier, for Mr. A. J. Kirn reports its arrival at Copan in Washington County on April 25, 1913; April 25, 1916, and April 24, 1917; while Mr. W. H. Koons' earliest dates for Tulsa are April 20, 1923; April 22, 1924; April 20, 1925; April 20, 1926; April 21, 1927. In Norman the last birds have been seen on the following September dates: 19, 1920; 18, 1921; 18, 1922; 14, 1923; 20, 1925; 21, 1926.

At Austin, Texas, Mr. G. F. Simmons (*Birds of the Austin Region*, Univ. of Texas Press, 1925, pp. 249-251) gives dates of first arrival as between March 26 and 31, and of latest occurrence in fall, September 22 and October 2. "At St. Louis," Mr. Otto Widmann (*Trans. Acad. Sci. St. Louis*, xvii, 1907, p. 212) writes, "and in central Missouri generally the first may be expected between April 27 and 29, sometimes a day or two earlier, as April 26, 1882 and April 25, 1883." Near Sioux City, Iowa, Mr. W. W. Bennett (*Proc. Iowa Acad. Sci.*, xxiv, 1917, pp. 285-293) gives the median spring date, May 16, the latest fall one, September 16.

As to nesting dates, complete sets have been found in Austin from April 25 to July 1, in Tulsa May 5 to June 30 (Mr. George W. Morse), in Sioux City the first

and second weeks in June. Near Norman we find nests in process of construction the second week in May. The latest evidences of breeding have been young out of the nest fed by their parents on July 13, 1923, and July 21, 1926.

The typical set consists of four eggs. Bennett, Simmons and Kirn report occasional instances of five eggs. If Cowbird eggs are present the Vireo quota is almost always less than four.

The height of the nest from the ground is reported by Simmons as "1.12 to 10, once 25, average 3 feet"; by Bennett as 2 to 5, average of 13 nests, 2 11-16; by Kirn as 2 to 3½, average of 6 nests, 2½; by Morse as 1½ to 5 feet; while I found them from 15 inches to 10 feet, the average of 12 nests being 3 feet.

As to the fate of nests, Bennett reported 9 failures, 3 successes and one unknown; seven of the failures were due to Cowbirds, two of the nests containing three eggs of the parasite; but in no case was a Cowbird raised. Mr. H. P. Attwater (*Auk*, ix, 1892, p. 237) writes from the San Antonio region that it is "a rare occurrence to find a Bell's Vireo's nest that does not contain one or more Dwarf Cowbird's eggs. In one case a nest of this Vireo in a thorn bush contained four Cowbird's eggs, with three others lying on the ground three feet below." Of the 17 nests found by us, the outcome of two was unknown, but 15 came to untimely ends. In three instances Cowbirds had caused desertion, two nests having one foreign egg each and one having two; but in a fourth nest a Cowbird had been successfully raised while a baby Vireo was found crushed in the bottom of the nest. Cats caused six disasters; snakes or people may have been responsible in four other cases.

Both Simmons and Morse report nests in which false bottoms had been built over one or more Cowbird eggs. A curious instance of a double nest was found by the latter near Tulsa, June 15, 1926 (*Oologist*, XLIV, 1927, pp. 23-24); the second nest was built two-thirds of the way around the first and contained two eggs, when the young of the first brood were nearly ready to fly.

Columbus, Ohio, June 5, 1928.

FRAGMENTARY NOTES ON BIRD LIFE IN THE FIJIS

By W. J. BELCHER

Pluvialis dominicus fulvus. Golden Plover. A few notes from my personal observations of the Golden Plover in Fiji may throw some light on the migratory movements of this regular visitor. On September 16, 1926, while driving along the road in the Suva district, I observed a large flock of Plover, about 40 or 50, flying inland and very low. Just as they reached a position over the road, one of their number suddenly fell from the flock in an exhausted condition. It was so completely fatigued that it could not rise again, but feebly ran along the road before the motor and could easily have been captured. After a few minutes the weary little traveler regained sufficient strength to fly feebly another twenty yards or so, and again it dropped in the adjoining field. The above facts suggest the termination of a long and weary flight from some great distance overseas.

Plover continued plentiful on the inland flats and grassy uplands during the succeeding seven months, until April 8 to 12, when I observed large numbers feeding on the Rewa flats, about 15 miles inland. They were feeding on open grass fields and on newly plowed cane fields. Many of the birds were in full breeding plumage, with the broad black streak extending from the throat down the center of the breast to the abdomen. I visited the same locality again a week later, April 19, and every Plover had departed. During frequent visits in May, June and July, not a sign of the Golden Plover has been seen. These observations might suggest that this transient spends 7 months in the Sunny South Sea isles and 5 months in the colder climes of the north, approximately. Snipe were quite plentiful in Fiji several weeks after the departure of the Plover. I have taken Snipe and Plover in November, Godwit in December, and a Bristle-thighed Curlew in July.

Some of my readers may be interested to compare notes on the dates of the arrival and departure of the Plover in Fiji with dates of arrival and departure from Siberia or Alaska, as far as is known.

Acridotheres tristis. Indian Mynah (introduced). This impudent immigrant has increased to such an extent in recent years, that it is now looked upon in Fiji as a common pest. Especially is this so during its breeding season in November and December, when kitchen stove-pipes almost daily become choked with dried grass, paper, rags, and all kinds of rubbish, due to their persistent attempts at nest building. At my residence in Suva, so persistent were these birds, that it was found necessary to wire on a piece of fine wire-netting to prevent their entry down the funnel. The following morning, hearing a considerable commotion up above, I went out and was much amused to see the two would-be home-builders, in very angry mood, clinging to the netting, pushing with their feet, and pulling at the wire with the beak, in a vain attempt to pull down the barrier.

The Mynah is evidently just as greedy for money as his inseparable companion the Hindu. When removing an old hut, I had occasion to pull down a nest of the Mynah from under the roof. This nest was unusually large for such a small bird, and would have filled a wheel-barrow to over-flowing with rubbish, rags, sticks, etc. Among other things, I found a 5/- Treasury paper note, built into the nest, probably picked up from the roadside.

On another occasion, November 25, 1926, I examined a Mynah nest near Suva, which was built in the top of the funnel of a big steam roller, which had been laid off for a few weeks. This nest contained six beautiful blue eggs. When blown, it was found that three of these eggs were positively fresh and newly laid, whilst the remaining three were in an advanced state of incubation! This seems to point to the fact that,

like the domesticated fowl, two different birds will sometimes make use of the same nest.

One bright morning, about 7 A. M., I was checked in my walk by seeing a Mynah-bird alight on the road a few yards ahead of me, carrying a blue egg of its own species, which had a puncture in the shell, which enabled the bird to hold it in its bill. As I watched, the impudent fellow coolly made a meal by extracting the yolk, and flew off. Whether this meal was the proceeds of a daylight robbery, or a case of "birth control", I had no means of ascertaining.

The Mynah is well known for its pugilistic proclivities and, as a case in point, I here mention one of many bitter quarrels that I have witnessed. On the morning of May 20, I observed four Mynah-birds, in pairs, engaged in deadly combat. They were rolling about in the center of the roadway, firmly locked together with talon and beak. They were so serious about their dispute, that they took little notice of my approach until I got to within ten feet of them. Then they disengaged and with some difficulty flew off. The large white patches on the wings of two of the birds were saturated crimson with blood.

Chrysoenas luteovirens. Golden Fruit Dove. While in the forest at Colo-i-suva, on Viti-levu, November 30, I was attracted to a spot near a stream, by the "barking" call of a male Golden Dove. These charming little doves, with their bright golden lanceolated plumage, so closely resemble the yellow decaying leaves of the forest that it is almost impossible to locate them until they "bark" or move. After locating the bird in question, I discovered an exceedingly fragile "nest", or more correctly speaking a platform, composed of about half a dozen frail twigs carelessly laid cross-wise on a fork of a slender branch. Poised precariously on these, was one solitary white egg, rather long and pointed at both ends. Due to its contents it appeared to be faintly pink.

The position of the "nest" was cunningly chosen, overhanging a ravine, and well-nigh impossible to reach. During my attempt to secure the egg, by carefully pulling down the branch, it unfortunately rolled off its platform and crashed. It was partly incubated. An observer has good cause to wonder how the egg of the little fruit dove retains its precarious position on such a frail platform during the swaying of the branches on a windy day!

Strix lulu. White Owl. On April 9, 1927, when out in the country, $4\frac{1}{2}$ miles from Suva, I was shown a nest of the White Owl (native Lulu). It was situated in the hollow of an "ivi" tree, a Fiji chestnut. In the bottom of the hole were five large dirty white eggs, almost the size of those of a young domesticated fowl. When washed, however, the eggs were of a clean white, but not of a glossy surface. When taken home and blown, some of the eggs were found to be in a much more advanced state of incubation than others. Two of the embryos were well formed, while in the others, the change had barely commenced.

About two weeks later, I was in the same locality and, out of curiosity, sent a Fijian boy up the tree to examine the nest, when to my surprise he reported five new eggs replacing those previously taken away! On this second occasion, I did not molest them, and I trust that the family was successfully reared.

Strix lulu does not appear to utter any night-cry or call note, the only sound emitted being what I can best describe as a wheezy hiss. During my five years' experience, I have never observed a "Lulu" in the forest during the full daylight hours, as is so often the case with the New Zealand "More-pork." On the outskirts of the forest he appears after sundown, in slow and silent flight.

Suva, Fiji, August 30, 1927.

A TURKEY BUZZARD ROOST

By FRANK A. LEACH

Buzzard's roosts are such places as the well known scavenger bird, the Turkey Buzzard, or Turkey Vulture (*Cathartes aura septentrionalis*), selects and habitually makes use of for passing the night. Although during the day these vultures seem to pursue their hunt for carrion food independently of one another, and are seldom seen in greater number than two, three, or four, unless some large carcass has been discovered, when the day's feeding is over and it comes time to prepare for the night they display a remarkably gregarious habit. A place is selected in a heavy growth of timber, and there the birds congregate and roost among the tree-tops for the night. Once a roosting place has been chosen, it continues to be the nightly resort of the buzzards, not only night after night, but year after year.

How much interference with the coming of the big birds, or the presence of humans in the vicinity of the roosts, it would require to cause an abandonment of the chosen places, is an open question, as will be noted by statements to follow. Another unsettled feature of the roosting habit of the vultures is the extent of territory supplied by one roost. It must be considerable, judging from the fact that in and about the neighborhood of the roost there are times when not a single buzzard can be seen, and miles from the place can be traveled without sight of one. Yet, with the closing of the day, these most graceful flyers come soaring in to the chosen spot, at times singly, but more commonly in two's, or three's, or in even greater numbers, and frequently at such heights that they appear but little more than specks in the sky. As I have seen but one roost, and have not found any Pacific Coast literature bearing on the subject, I am unable to give the average number of vultures constituting the night colonies. However, the roost I am about to describe has as its maximum number about thirty. Another peculiar feature in the habits of the birds is that they seek for nesting purposes rough, rocky places, difficult of access, away from the roosting center. The nest may be placed in a small cave, recess, or hollow stump, but wherever it may be, it is most securely located with minimum chances of being disturbed.

Although I have been interested in all kinds of birds and their habits from boyhood days here in California, it was never my fortune to discover a buzzard's roost until four years ago. Then, as now, I was living at the Mount Diablo Country Club, situated at the base of the southwestern flank of Mount Diablo. The club grounds embrace several hundred acres of land. On the extreme western limit of these grounds there is a grove of large eucalyptus trees. Until about five years ago they were so isolated from any of the activities of the club that the place was seldom visited; but in 1923 the club extended its golf course so that one of its greens and connecting fairways were located along the north side of the grove of eucalyptus, and as a consequence thereafter the locality was seldom without the presence of golf players or workmen tending the golf course. In the year prior, on the opposite side of the grove, a large gang of men with teams of horses and excavation appliances were engaged for several months in constructing a large reservoir.

Very soon after the golfers began to use this new part of the course it was reported to me that some Turkey Buzzards were nesting in the grove. An investigation failed to reveal any nests, but did develop the fact that here was a real Buzzard's roost, which seemed to be the night quarters for about thirty of the birds. The conditions about the grove had been so changed, as detailed in the foregoing paragraph, that I thought it probable the buzzards would now be so disturbed that they would abandon the place and seek new roosting quarters, of greater seclusion. But four years

have come and gone with no change in the popularity of the grove as a roosting place, with little or no change in the number of lodgers. The number seems to vary in that there appear to be fewer in the late spring and summer months than in the fall and winter, which might be accounted for by absence of breeding birds.

It is an interesting sight to watch the coming in of the vultures in the late afternoons and in the early evenings. In the winter months I have seen their flight begin as early as half past two in the afternoon, though this was on a stormy day. In the period of lengthened days the flight begins from four-thirty to five P. M. I am unable to say how late it continues; for with the approach of sundown the numerous mosquitoes make a late watch of the place too uncomfortable. Ordinarily the buzzards come sailing in on motionless wings, at high altitude, as if coming from a distance. When over the grove or roosting place, they begin to soar in circles of graceful flight. Sometimes they soon spiral down and hunt out a suitable or favorite tree branch for a resting place; then again they will remain overhead for an indefinite length of time soaring at different levels, so that occasionally they appear as mere specks. On a recent visit to the grove I watched a group of three buzzards that came in and swung around a time or two over the trees, just clearing the tops; then the two began an upward spiral flight lasting until they had passed out of sight. The seeming absence of any benefit or useful purpose to accrue to the birds by such flights leaves but one explanation for them, and that is they must be excursions for the enjoyment of their wonderful wing powers. No other bird surpasses the ease, grace and charm of the movements of the vultures, when soaring high in the air on motionless wings with graceful dips, spirals and circles. As Blanchan says, it suggests the "very poetry of motion."

At times three or four birds, after having lit in the trees and seemingly settled down for the night, would take to wing and indulge in one of these flights; but more commonly when the incoming birds once found their roosting place they remained there with but little shifting of position, though with occasional disputes over the possession of a choice branch.

Though there are several hundred trees in the grove, and one tree appears as good as another for the use that the buzzards put them to, the birds confine their nightly occupation to a certain group of half a dozen trees. If the near presence of golfers and workmen were objectionable, the birds, by changing the roost to the southern part of the grove, could regain a place of isolation and thus avoid the trouble. Apparently this is a matter of indifference with them. Even last summer and fall when workmen were employed in chopping down and cutting up into firewood about twenty trees, some of which were within 125 yards of the roost, there was no apparent disturbance of roosting habits of the colony.

The departure of the buzzards from the roost in the morning is not a sudden or hasty action. On the contrary the taking off in search for their food for the day is a very deliberate proceeding, by one, two, three or more birds at a time. This movement ordinarily begins with sunrise and may continue for nearly an hour, or until the last of the flock has taken the air. It requires but a few flops of their wings for the vultures to rise from and clear the branches, and then, as a rule, instead of sailing off in direct flight in some particular direction, they soar about the vicinity, frequently spiraling to a great height, where they sail round and round with the least seeming effort, and as in the evenings, apparently for the pure enjoyment of it. While soaring round in their graceful flights, the birds drift off in some chosen direction until they pass out of sight.

It is not uncommon to see the birds raise their wings partially opened, holding them in that position for several minutes before taking flight, and then again it is not

unusual to see birds that had taken flight, return to the roost as if to get a more satisfactory start for the day.

According to my recollections, Turkey Buzzards were more commonly seen, or existed in greater numbers, in the early days of the settlement of California than now. A far greater number of cattle and horses occupied the grazing lands, and death among the animals was of sufficient frequency to keep these birds supplied with food. In the later 50's, in the central and northern parts of the state, it was not uncommon also to see the great Condors (*Gymnogyps californianus*) associated with flocks of a dozen or more buzzards, feeding on the remains of a dead horse or steer. I frequently saw them between the years of 1857 and 1860 on the bare hills of lower Napa Valley. They were so much larger than the buzzards that there was no trouble in distinguishing one from the other. Generally where there was a flock of the smaller birds gathered about a carcass, there would be two or three of the big Condors. It is my impression that after 1859 or 1860 the latter were seldom seen, in the Napa section at least; and I think the extinction of the Condor in northern California took place in the decade following 1860. The Turkey Buzzards, however, are still with us, and likely to remain as long as food conditions continue as favorable as at the present time. Should a change for the worse take place, it is doubtful if they, like their smaller relative, the Black Vulture of South and Central America, would take to a city life, and become scavengers of back-yards and depositories of garbage.

Diablo, California, July 24, 1928.

NOTES ON BIRDS OBSERVED IN MOFFAT COUNTY, COLORADO

WITH THREE ILLUSTRATIONS

By RUSSELL W. HENDEE

During the spring and summer of 1924, I was given an opportunity to secure some interesting and fairly complete notes on the birds of the little studied region lying in the northwestern corner of Moffat County, the most northwestern county in Colorado. While engaged chiefly in other work for the Colorado Museum of Natural History, the four members of our party were continually on the lookout for information concerning the birds of the region, and the records offered herewith include the observations of the entire party. In all doubtful cases specimens were collected, and many of these were identified by Dr. H. C. Oberholser of the United States Biological Survey.

With very few exceptions the observations recorded in this list were made in a tract about twenty miles in length and five in width, the limited area covered making possible a reasonably intensive study in the time at our command. From April 24 until May 8 we were stationed at the Two Bar ranch, on the Little Snake River, one of the tributaries of the Bear. The observations made there cover the greater part of the migration period; the birds that arrived after that time were for the most part summer residents. From May 8 until the middle of July we were located at the edge of a dry valley locally known as Majors' Sand-wash. The few springs along the ridges which border the Sand-wash make excellent observation points for bird study. The whole region covered extends westward from the Little Snake to the divide between the Sand-wash and Vermilion Creek.

Along the Little Snake fairly dense thickets of cottonwoods, willows, and smaller bushes form excellent cover for birds. Away from the river the flats are covered with sage, greasewood, and rabbit brush, while the ridges are densely covered with pinyon and juniper. Of the springs mentioned in the notes, Two Bar Spring lies about twelve miles west of the Little Snake, while Spicer's Spring is seven or eight miles farther west.

I am indebted to Director J. D. Figgins, of the Colorado Museum of Natural History, for permission to publish these notes, which were made in the interests of that institution.

Anas platyrhynchos. Mallard. A fairly common migrant along the Little Snake River. We observed these birds several times feeding in a slough near the river.

Mareca americana. Baldpate. A baldpate was collected at a slough near the river on April 27, feeding in company with Mallards and Green-winged Teal. The species was seen again on May 5 at the same place.

Nettion carolinense. Green-winged Teal. Several seen on April 27, as mentioned above.

Querquedula discors. Blue-winged Teal. One taken at a pond near the river on April 29. It was feeding in company with Mallards and Cinnamon Teal.

Querquedula cyanoptera. Cinnamon Teal. Observed several times between April 24 and May 5. The birds were apparently already mated, as they were seen in pairs on every occasion.

Dafila acuta. Pintail. A few seen in a pond near the river on April 29 and again on May 5.

Branta canadensis. Canada Goose. A pair seen on a number of occasions along the river. I was informed that they breed occasionally along the Little Snake, and more commonly along the larger rivers near-by.

Ardea herodias. Great Blue Heron. One seen on a bar in the river on April 27 and again at the same place two days later.

Fulica americana. Coot. One was seen in a pond near the river on April 27. When first seen it was hiding under some willows which overhung the water, and when disturbed it took refuge in an enlarged and partly submerged muskrat burrow. It was seen at the same place a few days later.

Steganopus tricolor. Wilson Phalarope. A flock of five was seen in a pond near the river on May 5.

Pisobia minutilla. Least Sandpiper. Two were collected at a pond on April 27. Several others were seen at the same place a few days later.

Tringa solitaria cinnamomea. Western Solitary Sandpiper. Occasionally seen along the river; one bird taken at a pond on April 29. They were exceedingly wary whenever seen.

Oxyechus vociferus. Killdeer. Seen occasionally about the ranch and along the river, from April 25 until our departure on May 8.

Centrocercus urophasianus. Sage Hen. A few were seen near Craig on April 22 and 23. While on our way to the Two Bar ranch on April 24, a number were seen. Several which were dusting themselves in the road appeared little afraid of our truck, though it passed within a few feet of them. On April 27 a female was collected near the river, the only one of the species seen in the river bottom. This bird contained a fully developed egg. The birds are said to winter in the Sand-wash in immense flocks and many of their winter roosting places were seen. Although I was told that the birds breed mostly on the slopes of the near-by mountains, two abandoned nests were found on the sage flats of the Sand-wash. One found on June 2, appeared to have hatched but a few days before. Another found some time later had apparently been destroyed by a coyote. A single bird was seen on the sage flat on May 26, and three other adults were seen on May 31. On June 5 a male and a female were collected out of a flock of about ten adults. The male was in worn plumage but not molting. The female was molting and the head and neck were nearly bare. On July 15 several hundred were seen along the road between Sunbeam and Craig. Many of these were birds of the year, about the size of sharp-tailed grouse.

Zenaidura macroura. Mourning Dove. A single dove was seen at the Two Bar ranch on April 25, and from that time on they were seen regularly in increasing numbers. About the springs at the edge of the Sand-wash, where they came to drink both morning and evening, they were seen in considerable numbers. They appeared to be late breeders. From June 14 to 20 many doves were seen about Spicer's Spring. They were apparently mating at this time and the males fought a great deal when they came to drink in the evening. No nests were found until June 22. On that date a bird was found sitting on two eggs laid on a horizontal log that formed part of the approach to a wild horse trap. There was no attempt at a nest.

Circus hudsonius. Marsh Hawk. One seen June 6 a few miles from our camp.

Accipiter velox. Sharp-shinned Hawk. Seen several times along the river and about the juniper ridges. A female shot on May 18 contained a fully developed egg.

Buteo borealis calurus. Western Red-tail. Seen on May 5 and 7 near the Little Snake River.

Buteo swainsoni. Swainson Hawk. One seen near Spicer's Spring, June 24.

Archibuteo ferrugineus. Ferruginous Rough-leg. One seen not far from Spicer's Spring, June 13.

Aquila chrysaëtos. Golden Eagle. Seen occasionally along the river. On May 30 one of the party found an abandoned nest containing two eggs which had been frozen. We were told that a pair of eagles had nested on a cliff near the river for a number of seasons.

Falco mexicanus. Prairie Falcon. On May 5 a Prairie Falcon killed a robin near the ranch house. None was seen in the Sand-wash; but on July 13 we saw one near the road close to the town of Sunbeam.

Falco sparverius phalaena. Desert Sparrow Hawk. Common everywhere in the region covered. The first nest with eggs was found on May 25. On June 9 I found a nest containing four eggs. The female was on the nest at the time, and in attempting to remove her I pulled out several of her tail feathers without dislodging or apparently frightening her, although she made no attempt at resistance. Most of the nests were in old flicker holes in junipers.

Asio wilsonianus. Long-eared Owl. Not uncommon among the junipers which covered the ridges both along the Little Snake River and at the borders of the Sand-

wash. A nest containing four eggs was found on May 28; the birds had appropriated an old magpie nest in a juniper tree. On almost every visit both birds were seen. The female would remain on the nest until I was within a few feet of her, and would sometimes return and alight in the tree while I was at the nest. On one occasion she came close enough to strike my cap with her wing. The male would often go through a peculiar and amusing performance. After a vain attempt to drive me away he would alight in a tree a short distance away, where he would flop about for a few minutes, calling loudly all the while. Then, apparently losing his balance, he would fall to the ground, where a few spasmodic movements always carried him behind a small bush. From this refuge he would watch me closely, without moving. If I walked toward him he would fly a short distance and fall again to the ground; if I paid no attention he would come closer and repeat the whole performance. The first egg in this nest hatched on June 9, the fourth on June 15. A month later all of the young had left the nest, the oldest going a few days ahead of the youngest.

Asio flammeus. Short-eared Owl. On April 25 we saw one bird near the Two Bar ranch; a few days later we found part of the plumage of another which had been dead for some time.

Bubo virginianus pallescens. Western Horned Owl. Not uncommon on the juniper ridges. The birds were frequently seen, and a deserted nest was found on May 19. The eggs had been broken some time earlier.

Ceryle alcyon. Belted Kingfisher. Seen about the ponds near the Little Snake on every visit.

Asyndesmus lewisi. Lewis Woodpecker. A pair was observed near our camp among the junipers on May 18.

Colaptes cafer collaris. Red-shafted Flicker. Fairly common along the river and on the pinyon and juniper ridges. The first eggs were found on May 19.

Phalaenoptilus nuttallii nuttallii. Poor-will. On May 16 a pair was seen, and after that the calls were heard frequently in the evenings. On the night of May 30 there was a heavy rain with some hail, and on the following day, while walking through a stretch of barren bad lands, I flushed a poor-will from almost under my feet. Upon looking closely I discovered a broken egg nearly buried in mud in a tiny gully. The back and tail of the bird, which alighted within a few feet of me, were thickly coated with dried mud, and I could see where it had broken the muddy crust in rising from the nest when I disturbed it. It was evident that the bird had stayed on the nest through the storm of the day before, though it must have been nearly covered by the water running down the rivulet in which it sat, and in spite of the fact that enough mud had washed under it to bury and crush the egg.

Chordeiles virginianus howelli. Howell Nighthawk. No nighthawks were seen until June 5, when several appeared about our camp, and we saw them every evening after that date. On June 9, I flushed five in a short walk among the junipers, but on July 4, I walked over the same territory without finding one. At that time they appeared to have retired to the higher ridges. The reference of the birds to this variety is based on Dr. Oberholser's identification of one specimen collected.

Aëronautas melanoleucus. White-throated Swift. A few were observed near the river on May 5, in company with a large flock of swallows. They were seen regularly about Two Bar Spring and appeared to be nesting about the cliffs on the higher ridges near our camp. On June 13, I found a great many of these birds flying about the cliffs bordering a small stream flowing into Vermilion Creek.

Selasphorus platycercus. Broad-tailed Hummingbird. Occasionally seen near the Sand-wash.

Tyrannus verticalis. Arkansas Kingbird. Two were observed near the road just outside the town of Sunbeam on July 13.

Myiarchus cinerascens cinerascens. Ash-throated Flycatcher. Occasionally seen about the Sand-wash; the first one was observed at a spring on May 19.

Sayornis sayus. Say Phoebe. One observed near the Two Bar ranch on April 27; after that date they were occasionally seen along the river and also about the edges of the Sand-wash. An old nest and a new one under construction were found on May 3, in a natural cave in a clay hill.

Empidonax wrightii. Wright Flycatcher. On May 25, while walking through a little valley among the junipers, my attention was attracted to a pair of small fly-

catchers. Their shyness and silence led me to believe them different from the common flycatcher of the region, the Gray Flycatcher. Returning to the locality on June 1, I collected one of the birds, which proved to be *Empidonax wrightii*. No others were seen.

Empidonax griseus. Gray Flycatcher. Though usually considered as merely of casual occurrence in Colorado, this proved to be one of the common birds among the junipers in the region covered. Two specimens were collected near the river, one on April 27 and the other a few days later. On the juniper covered ridges near the Sand-



Fig. 9. NEST AND NEST SITE OF GRAY FLYCATCHER IN JUNIPER; MOFFAT COUNTY, COLORADO, JUNE 3, 1924.

wash they were rather common. On May 31, J. S. Young of our party collected a set of eggs with the bird. So far as I can learn this is the first nesting record for this bird in Colorado. On June 3 I found two other nests, one containing eggs and the other in process of construction. This nest was later abandoned. F. W. Miller collected a third set of eggs a few days later. The nests were all built from juniper bark and lined with feathers. All of the bark used was carefully gathered from the gray and weathered outside strands, and, with the irregular outlines of the nest, served to make them

surprisingly difficult to see. All of the nests were built in forks in juniper trees. The birds were rather noisy and not at all difficult to observe. They were sometimes seen among the sage bushes at some distance from the junipers.

Otocoris alpestris leucolaema. Desert Horned Lark. Exceedingly abundant about the Two Bar ranch on April 25. The birds seemed on this occasion to have been driven for shelter to the river valley by a snowstorm of the preceeding night, as they were seen only occasionally afterward. Seen in the Sand-wash in small numbers, and undoubtedly nested there.

Pica pica hudsonia. Magpie. Many old magpie nests and a few birds were seen near the river. Among the junipers bordering the Sand-wash a number of old nests were found, but no birds were seen.

Aphelocoma woodhousei. Woodhouse Jay. One taken near the river on April 27 and another at Two Bar Spring on May 21. A few others were seen about the spring.

Corvus corax sinuatus. Raven. Several seen along the river and on the juniper ridges near the Sand-wash, where they are said to be numerous in winter.

Corvus brachyrhynchos hesperis. Western Crow. On May 3 my attention was called to a crow in a field near the Two Bar ranch. The ranchman who first noticed it was not familiar with the bird and said it was the first of the sort he had seen. The name crow is used locally for the commoner raven.

Nucifraga columbiana. Clark Nutcracker. A single bird was seen at Spicer's Spring on June 22.

Cyanocephalus cyanocephalus. Pinyon Jay. A few were seen along the river, and they were common among the junipers near the Sand-wash. F. W. Miller found two nests with eggs, on May 17 and May 19, respectively. Young birds were seen on the wing on May 26. Two families of newly hatched young were found on May 27. After May 23 these birds were commonly seen in large flocks. On June 24, I observed a flock feeding on locusts, which were just emerging at the time.

Xanthocephalus xanthocephalus. Yellow-headed Blackbird. One seen at the Two Bar ranch on May 4.

Agelaius phoeniceus fortis. Thick-billed Red-wing. Common along the Little Snake; several specimens collected were identified as of this variety.

Sturnella neglecta. Western Meadowlark. Common along the Little Snake River during our stay, April 25 to May 8.

Euphagus cyanocephalus. Brewer Blackbird. A few observed at the Two Bar ranch on April 27. From that time on they became increasingly common; by May 8 they outnumbered the red-wings.

Carpodacus mexicanus frontalis. House Finch. A few seen along the Little Snake and among the junipers which border the Sand-wash. They did not become common until about June 1. The first one observed with nesting material was seen on June 10.

Poocetes gramineus confinis. Western Vesper Sparrow. By far the commonest bird along the Little Snake River from April 25 until May 1. On May 5, though still as common as ever, it was greatly exceeded in numbers by the Brewer Sparrow. After May 27 it was seen in small numbers on the sage flats of the Sand-wash. On June 15, J. S. Young found two nests containing eggs. One set hatched a few days later.

Passerculus sandwichensis alaudinus. Western Savannah Sparrow. One was taken near the Little Snake on April 25 and another on May 5. No others were seen.

Chondestes grammacus strigatus. Western Lark Sparrow. A single Lark Sparrow appeared at the Two Bar ranch house on April 25. By May 3 the species was fairly common near the river. None was seen in the Sand-wash until May 21, when we saw a few on the sage flats. From that time on we saw them regularly in small numbers, apparently nesting, though no nests were found.

Zonotrichia leucophrys leucophrys. White-crowned Sparrow. One was taken near the river on May 5. Several others were seen the following day and a few were observed about Two Bar Spring on May 25.

Zonotrichia leucophrys gambelii. Gambel Sparrow. First taken, near the river, on April 29. By May 5 it was a rather common bird in thickets along the river.

Spizella passerina arizonae. Western Chipping Sparrow. First seen on May 12 about Two Bar Spring. A pair was observed collecting nesting material near camp on May 19. On June 1, a nest containing four fresh eggs was found on a juniper branch about five feet from the ground. The nest was composed entirely of grass.

Spizella breweri. Brewer Sparrow. A few were found about the Two Bar ranch on April 25, but the species remained rather uncommon until about May 1. On May 5 it was by far the commonest bird in the region, and remained so until our departure for Two Bar Spring on May 8. About the spring it was the commonest sparrow and doubtless the commonest breeding bird. The first nest was found on May 23 and the first egg was laid the following morning. After that time many nests were found. Fresh sets continued to be found until the middle of July, when we left the country.

Junco hyemalis mearnsi. Pink-sided Junco. A few were seen about the Two Bar ranch from April 25 to 30. One was also seen at Two Bar Spring on May 9.

Junco hyemalis shufeldti. Shufeldt Junco. One junco collected at the Two Bar ranch on April 29 was identified by Dr. Oberholser as of this variety.

Junco phaeonotus caniceps. Gray-headed Junco. One seen at the ranch on April 25.

Amphispiza bilineata deserticola. Desert Sparrow. One taken near the Little Snake River on May 1. F. W. Miller reported seeing the species, apparently nesting, near a spring in the Sand-wash on June 5.

Amphispiza nevadensis nevadensis. Nevada Sage Sparrow. Several were seen about Craig on April 22 and 23. From April 24 until May 1 they were very common about the Two Bar ranch. On May 5 they were much less common, and from that time on they were more rarely seen along the river. They nested in considerable numbers on the sage flats throughout the Sand-wash. The first set of eggs was found on May 20, and after that date a number of others were located. Most of the nests were in sage bushes about a foot from the ground, but many were on the ground under the bushes. The nests were made of grass and lined with feathers and in some cases wool. The last set of fresh eggs was found on June 25.

Melospiza melodia montana. Mountain Song Sparrow. One was taken near the river on April 27 and another on May 6.

Melospiza lincolni lincolni. Lincoln Sparrow. Three were collected near the river, one on April 29, one on May 5, and one on May 6. On every occasion the birds were at first mistaken for house wrens, which were more common in the vicinity, on account of their wren-like manner of creeping about in the underbrush.

Passerella iliaca schistacea. Slate-colored Fox Sparrow. One was collected near the river on April 29.

Pipilo maculatus montanus. Spurred Towhee. One was taken near the river on May 5.

Oberholseria chlorura. Green-tailed Towhee. Two were collected near the river, one on May 5 and one on May 6. They were seen occasionally near Two Bar Spring. On June 9, I flushed a towhee from a bush near the spring. Flying a few feet to one side it gave the customary imitation of a crippled bird, which led me to believe that there was a nest in the vicinity. However, after careful examination I failed to find a nest, and, though I returned to the locality a number of times, I never located a nest or saw a bird in the vicinity again. On June 12 two nests were found, one on the ground under a bush near Spicer's Spring, the other near the top of a dry ridge and about a foot from the ground in a sage bush. The eggs from these sets were carried to our base camp and three days later when I unwrapped them to blow them I found to my chagrin that one set was just hatching, the young birds being still alive.

Passer domesticus. English Sparrow. A few were seen about every ranch visited, but none at any distance from the buildings.

Petrochelidon lunifrons lunifrons. Cliff Swallow. On our arrival at the Two Bar ranch, we found the mud nests of a large colony of Cliff Swallows plastered to a cliff across the river from the ranch. None of the birds was seen, however, until May 5. On that date we visited a large pond near the river and about five miles from the ranch. Flying over the water was a large flock of swallows. Cliff and Violet-green were the most abundant, but there were a number of Barn and Rough-winged, and a few Bank swallows, in the flock. A few White-throated Swifts were also present. After that day Cliff Swallows were seen commonly about the ranch.

Hirundo erythrogaster. Barn Swallow. First seen on May 5, as mentioned above. A few were seen later about the ranch.

Tachycineta thalassina lepida. Northern Violet-green Swallow. Some of these swallows were seen near the river on April 29, but they did not become common until May 5. They were seen regularly about the springs near the Sand-wash and seemed to be nesting in holes in the cliffs.

Riparia riparia. Bank Swallow. Seen on May 5, and not observed again.

Stelgidopteryx serripennis. Rough-winged Swallow. Greatly outnumbering the Bank Swallows seen in the flock observed on May 5, but not observed again. However, as we left the river a few days after that date they may breed along the river banks. A few holes were observed in the cut banks which may have belonged to these birds.

Lanius ludovicianus excubitorides. White-rumped Shrike. Fairly common throughout the region covered. Along the river shrikes were especially numerous. A set of eggs was found on May 31. The nest was built in a juniper and made of thorny rabbit-brush twigs.

Vermivora virginiae. Virginia Warbler. One was collected at the edge of the river on May 6.

Vermivora celata. Orange-crowned Warbler. The only one seen was taken at Two Bar Spring on May 27.

Dendroica aestiva. Yellow Warbler. One seen on May 5 and a few others on the following day, near the river.

Dendroica coronata. Myrtle Warbler. A pair was seen on May 5 near the river, and the male was collected.

Dendroica auduboni auduboni. Audubon Warbler. A few were observed on May 1; on May 5 they were fairly common. On the following day a great many were seen in thickets along the river.

Dendroica nigrescens. Black-throated Gray Warbler. Two were collected on April 26 among junipers not far from the river. About the springs at the edge of the Sand-wash they were fairly common throughout the summer, though no nests were found.

Geothlypis trichas occidentalis. Western Yellow-throat. One seen at a small pond near the river on April 27; a specimen was collected at the same place a few days later.

Anthus rubescens. Pipit. One taken at the edge of a pond near the river on April 29. On May 5 a large number of these birds were seen feeding at the edge of the water at the same pond.

Oroscoptes montanus. Sage Thrasher. Very common along the Little Snake, and nesting in considerable numbers in the sage-brush flats of the Sand-wash. The first eggs were found on May 16. No young were seen on the wing until June 24.

Salpinctes obsoletus. Rock Wren. A few were seen near the river throughout our stay, and they were usually to be seen about the rocky ridges at the edge of the Sand-wash. On June 25, I found a nest in a peculiar situation. The interior of a small boulder on a rocky hillside had been dissolved away leaving a hollow in the center about six inches in diameter. There was a hole in each side, one about two inches in diameter and the other about half as large. The larger opening had been stopped up by the birds, which had built their nest inside, using the other for a door way. The eggs had not hatched at the time.

Thryomanes bewickii bairdi. Baird Wren. While frequently reported from the juniper and pinyon region of southern Colorado, the Baird Wren has seldom been recorded from the northern part of the state. However, we found this species among the commonest of the breeding birds of the junipers near the Sand-wash. A few were seen among the trees on the ridges near the river, but the birds were much more numerous in the more arid region to the westward. A fresh nest, empty, was found on May 19. The first egg was laid about a week later and the set of six was completed on May 31. The nest was composed mostly of wool and feathers and a few small pieces of paper, loosely piled in a natural cavity in a juniper tree, about two feet from the ground. The opening was very small.

A second nest was found on June 3. It was placed in a dead juniper branch about five inches in diameter, the opening, caused by the breaking off of a small branch, being about an inch in diameter at the widest point. The five eggs in this nest were hatching when it was visited on the following day. Though the birds were common and we spent a great deal of time searching for the nests, only two others were found, one being an old nest of the previous year. The other nest, though fresh when found, was abandoned without being used.

The eggs were creamy buff in color when fresh, with many small brownish spots, principally about the larger end. When blown, the color becomes pure white with the exception of the spots. The birds are very inquisitive and frequently followed us for some distance, making a good deal of noise but remaining concealed most of the time.

They sing often. The song is cheery but monotonous. F. W. Miller reported seeing these birds in considerable numbers during the breeding season in the sage-brush near a spring in the Sand-wash several miles from timber. They were frequently seen entering holes in the cliffs, where they seemed to be searching for insects, as there was no evidence of their nesting in such places.

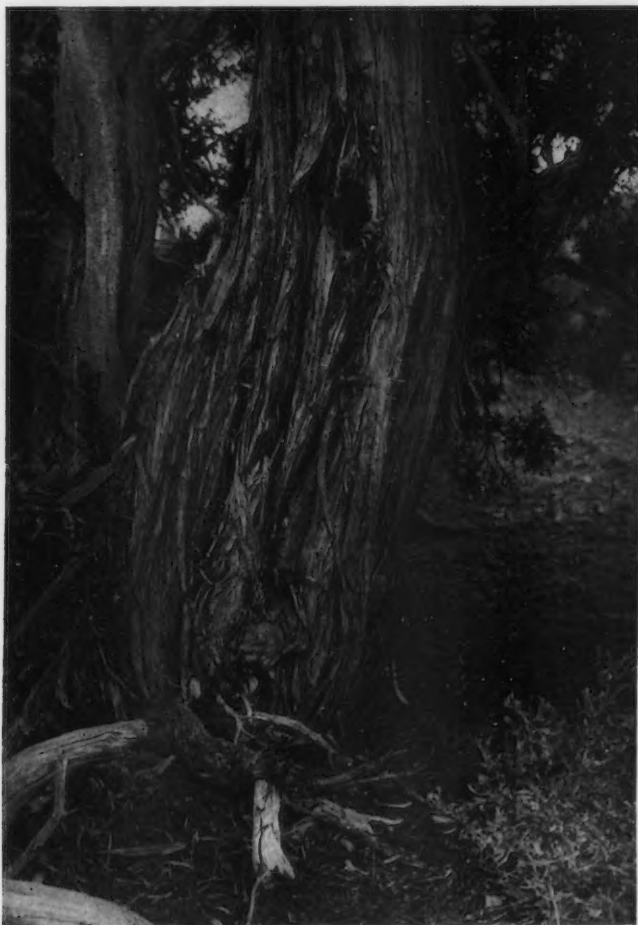


Fig. 10. NEST HOLE OF BAIRD WREN IN JUNIPER; MOFFAT COUNTY, COLORADO, MAY 31, 1924.

Troglodytes aedon parkmanii. Western House Wren. Three were collected near the Little Snake River, one on April 27, one on May 5, and one on May 6. Several others were seen on the same dates.

Telmatodytes palustris plesius. Western Marsh Wren. One was seen at a pond

near the river on April 27, and specimens were collected near the same place on April 28 and on May 5, respectively.

Sitta carolinensis nelsoni. Rocky Mountain Nuthatch. A pair was seen regularly about Two Bar Spring, where they came daily for water.

Baeolophus inornatus griseus. Gray Titmouse. Frequently seen about Two Bar Spring. Flocks of from four to eight birds were seen early in June, possibly families which had already left the nest.

Penthestes gambeli gambeli. Mountain Chickadee. The only chickadee observed during the season was one of this species which visited Two Bar Spring on May 10.

Regulus calendula. Ruby-crowned Kinglet. A single bird was collected near the river on May 6.



Fig. 11. NEST AND EGGS OF BAIRD WREN AS REMOVED FROM SITE SHOWN IN FIGURE 10.

Poliophtila caerulea obscura. Western Gnatcatcher. One collected near Two Bar Spring on May 27.

Myadestes townsendi. Townsend Solitaire. A Solitaire was seen near the Two Bar ranch on April 30 and again on the following day.

Planesticus migratorius propinquus. Western Robin. Fairly common about the Two Bar ranch throughout our stay. Never seen far from the river.

Sialia currucoides. Mountain Bluebird. Common at every point visited. A newly built nest was found in a hollow juniper on May 1. The first eggs were found on May 17. Three nests were found in holes in dirt banks, and many in hollow junipers. In many cases they were placed in old flicker holes. One set was not completed until June 28. The nests were built mostly of juniper bark and lined with feathers. Young were seen on the wing on June 24.

Denver, Colorado, January 10, 1925.

A NEW WOOD RAIL FROM EL SALVADOR¹

WITH FRONTISPIECE AND ONE OTHER ILLUSTRATION

By DONALD R. DICKEY

In describing an apparently unknown species of Wood Rail of the genus *Aramides* from El Salvador, Central America, I take profound pleasure in commemorating a personal friendship and close scientific association of eighteen years' standing, by naming it for Adriaan J. van Rossem.

Aramides vanrossemi, sp. nov. El Salvador Wood Rail.

Type.—Male adult, no. 18750, collection of Donald R. Dickey; Barra de Santiago, Ahuachapan, El Salvador; April 6, 1927; sea level; collected by A. J. van Rossem; original no. 11618.

Specific characters.—Very similar in plumage to *Aramides albiventris* Lawrence, of Yucatan and British Honduras, but coloration slightly paler throughout, terminal third of maxilla apple green instead of yellow, iris lake red (close to "rose red" of Ridgway, Color Standards and Color Nomenclature, 1912) instead of yellow; size larger, and bill proportionately very much stouter. For comparison with other forms, a tabulation of characters is given below.

Range.—Low, tropical forest and mangrove swamps in extreme western El Salvador, and probably northwest along the Pacific coast of Guatemala.

Although the Wood Rails have been revised by Bangs (American Naturalist, 41, March, 1907, pp. 177-187) and more recently by Miller and Griscom (American Museum Novitates, 25, December 9, 1921, pp. 9-11) the collected material does not yet suffice to establish fully the relationships of the Central American and Mexican forms. Nor does the discovery of the present bird assist materially in clarifying the situation. Briefly, Bangs treats both *plumbeicollis* and *mexicanus* as geographic races of *albiventris*, whereas Miller and Griscom, while admitting their undoubted common origin, feel that lack of known intergradation makes it preferable to continue to treat them as full species unless and until further evidence of intergradation is adduced. In support of this treatment they print (*sup. cit.*, p. 10) an extremely graphic table showing the various specific character combinations. For the sake of convenience the pertinent portions are here reproduced, with the characters of the new form incorporated.

COMPARATIVE TABLE

<i>A. albiventris</i>	<i>A. plumbeicollis</i>	<i>A. vanrossemi</i>	<i>A. mexicanus</i>
1. Broad patch of white feathers on abdomen.	Narrow patch of buffy feathers.	Broad patch of white feathers.	Narrow patch of buffy feathers.
2. Coloration paler.	Coloration darker.	Coloration paler.	Coloration darker.
3. Terminal third of maxilla yellow.	Terminal third apple green.	Terminal third apple green.	Terminal third apple green.
4. Iris yellow.	Iris orange-red.	Iris and eye-ring lake red.	Iris and eye-ring ?
5. Mantle faintly indicated.	Mantle conspicuous.	Mantle faintly indicated.	Mantle faintly indicated.
6. Culmen of males averaging about 61 mm.	Culmen of males averaging about 57 mm.	Culmen of males averaging about 72 mm.	Culmen of males averaging about 66 mm.

It will be seen from the above table that the exact relationship of *vanrossemi* is far from obvious, and to describe it as a subspecies without knowing the color of

¹ Contribution from the California Institute of Technology.

the iris and eye-ring of *mexicanus*, or the exact relation of that bird to *albiventris*, would therefore be premature to say the least, since it would be hypothecating an intergradation which in my opinion remains to be worked out. Meantime it is significant that the recently described race of *plumbeicollis* from Lake Nicaragua² shows no approach in characters to the bird immediately adjacent to it on the northwest in El Salvador and Guatemala.

One of the two specimens considered by Bangs to be intermediate between *albiventris* and *mexicanus* is no. 33668, U. S. National Museum, from Chiapam, Guatemala. In size and coloration it most certainly belongs with the El Salvador form. The coloration of the soft parts was not recorded by the collector and has of course now been lost in the specimen. In consequence its allocation to the El Salvador species must, to that degree, remain tentative.



Fig. 12. FRESH WATER JUNGLE STREAM, HAUNT OF WOOD RAILS AND LIMPKIN. BARRA DE SANTIAGO, AHUACHAPAN, EL SALVADOR, C. A.

In El Salvador this striking genus was encountered only at Barra de Santiago. There it frequents the maze of mangrove roots and marsh tangle where fresh and salt water meet. Its carriage in life is erect and almost more heron-like than ralline. In response to suspicion of danger this bird occasionally leaves its dense ground cover and voluntarily seeks vantage posts on high mangrove roots and stubs, the better to observe its surroundings. Traits more typical of the family crop out in the continuous tail-twitching of the birds, and in their raucous cackling.

One of the pleasures of working up this interesting Central American bird has been watching the effective effort of Major Allan Brooks in attaining faithful color reproduction (see frontispiece).

Pasadena, California, December 10, 1928.

² *Aramides plumbeicollis pacificus* Miller and Griscom, American Museum Novitates, 25, December 9, 1921, p. 11.

FROM FIELD AND STUDY

Audacity of a Sharp-shinned Hawk.—On the morning of October 28, 1928, in a line of bird banding traps in operation at Woodacre Lodge, Marin County, California, a wire netting, funnel type trap, 24 x 36 inches in size, was placed on the ground on the sunny side of a long pile of cordwood, the interstices of which afforded comforting protection to a flock of Golden-crowned Sparrows. Sharp-shinned Hawks (*Accipiter velox*), although nearly every trap had over it a cover made of 2-inch mesh wire netting to allow small birds to enter but to keep out cats, quail, etc., had been making efforts to get at the birds in some of the more exposed traps, but had succeeded only in causing more or less panic among the captives.

On one of my rounds that morning the trap at the woodpile was found to contain some sparrows. After removing the protective cover I was standing over the trap, with my feet rather wide apart for better balancing, with my soft hat in hand gently "shooing" the captive birds into the small catching box at the farther corner. In the midst of this operation I was startled by a feathered bolt, as it were, flashing past me from behind with incredible speed, that brushed my right knee as it passed and came suddenly to a full stop on top of the trap and only a few inches from my hand, with both talons trying to grab a sparrow through the wire netting.

I was so taken by surprise that almost involuntarily I struck at the hawk with my hat to save the birds from possible injury. This was an unfortunate impulse, for it would have been much better to have kept still so as to watch further developments, as the birds were not in any actual danger except through fright. Possibly my khaki-colored clothing blended sufficiently with the woodpile to make me inconspicuous, or else the hawk, a very small one, was made so bold by hunger as to be indifferent to the presence of a human being.—JOSEPH MAILLIARD, *California Academy of Sciences, San Francisco, California, October 31, 1928.*

British Columbia Records of Certain Unusual Sparrows.—We report the following more or less unusual records of sparrows in British Columbia during recent years.

Zonotrichia querula. Two immature birds captured and banded at Indianpoint Lake, September 24, 1926.

Zonotrichia albicollis. One individual captured and banded October 7, 1926, at Indianpoint Lake. Our neighbor, Mrs. Joseph Wendle, of Bowron Lake, also permits us to record the capture by her of two of this species during the spring of 1928, one on May 11, the other on May 14.

Spizella pallida. An immature male collected at Indianpoint Lake, October 9, 1928.

Melospiza georgiana. An immature male collected at Indianpoint Lake, October 9, 1928.

Mr. J. A. Munro has very kindly examined detailed large-scale photographs of the Harris Sparrows, and finds the identification unquestionable. Similar photographs of our White-throats were not very successful, but Mr. Munro finds identification from them "reasonably certain".

At the time of publication of Brooks and Swarth's "Distributional List" (September, 1925), only "eight or ten specimens" of the Harris Sparrow had been recorded in British Columbia, the northernmost of them at least 200 miles south of our record. By the same date only three White-throats had been recorded, only one Swamp Sparrow, and two Clay-colored Sparrows.—THOMAS T. McCABE and ELINOR BOLLES McCABE, *Indianpoint Lake, Barkerville, B. C., October 15, 1928.*

Notes from Napa Valley.—The Western Tanager (*Piranga ludoviciana*) has been nesting at my two-acre residence in the heart of Napa for some years past. This year there were two pairs, not far apart, one about 18 feet up in a hanging string of English Ivy; the other in the forks of the outer branches of an elm, about 25 feet from the ground.

Nuttall Poorwill (*Phalaenoptilus nuttallii*) was noted as resident at Samuel

Springs on Pope Creek about ten miles from Pope Valley, in Napa County. They are reported as abundant in the canyon at Walters Springs nearby.

Western Gnatcatcher (*Poliophtila caerulea obscura*) was nesting (two nests) at Samuel Springs, and the bird had been noted this year at Napa Valley Country Club, four miles east of Napa.

White-tailed Kite (*Elanus leucurus*). This bird was first seen by Boy Scout students on both sides of Napa Valley this summer. Nests (two) were found at "Congress Springs," about three miles west from Napa. As the farmer on whose ranch they nested maintains a bird sanctuary, they were saved from the fate which befell two other pairs at Browns Valley, about two miles north, where they were killed by a boy (not a member of B. S. A.) who claimed they were killing his pigeons. Report to the resident Game Warden was apparently ignored.

Wood Duck (*Aix sponsa*). Mr. H. C. Bryant observed these with me three or four years ago at a little wooded lake in the Valley floor about three miles north of Napa. Since that time they were scattered by poachers, despite the efforts of the farm owner to protect them; and they were not seen there in 1927. They are reported as having reappeared this September, about fifteen in number.—E. L. BICKFORD, Napa, California, September 26, 1928

Land Birds of a Pacific Coast Sea Voyage.—On September 22, 1928, the writer left San Francisco on the Mexican steamer "Bolivar" for La Paz, Lower California, via Mazatlan, Mexico, this being the first stage of a year's collecting trip in the interests of the California Museum of Vertebrate Zoology. It may be of interest to CONDOR readers to hear of the land birds that actually came on board the steamer, or were seen in close proximity to it, during the fifteen days it took to complete this journey. The steamer kept at a distance of from eight to twenty miles off-shore most of the way. The weather was windless and the sea calm the whole distance.

Burrowing Owl (*Speotyto cunicularia hypugaea*). When I went on deck at 7:00 a. m., September 22, I saw the owl. It was quite wild and would not allow a close approach. When disturbed, it would fly off the vessel and, skimming low over the water, would soon alight on another part. This owl came aboard when we were some eight miles off southern Monterey County, California, and remained with us all day. At 5:00 p. m., off Santa Barbara County, another Burrowing Owl came aboard, but stayed only a few minutes.

Audubon Warbler (*Dendroica auduboni*). At 7:30 a. m., September 25, as we were passing about two miles to the westward of Los Coronados Islands, Mexico, I noticed five of these birds flying on and about the steamer. They remained about an hour.

Ruby-crowned Kinglet (*Corthylio calendula*, subsp.?). At 9:00 a. m., the same day, four were seen on the steamer, and they were with us till the anchor was dropped, off Ensenada. None of these birds seemed at all exhausted, but were sprightly, flitting around in search of food.

Western Savannah Sparrow (*Passerculus sandwichensis alaudinus*). At 6:00 a. m., September 26, when I went on deck, two were seen hopping around the deck cargo. At this time, the steamer was about ten miles off San Antonio del Mar.

Yellowthroat (*Geothlypis trichas [occidentalis?]*). A fine male was seen among some potted plants on deck, at the same time that the Savannah Sparrows were noted.

Western Mourning Dove (*Zenaidura macroura marginella*). At 9:30 a. m., a single bird came aboard, to stay only a short time; it took off, flying high, toward shore.

Western Flycatcher (*Empidonax difficilis*). At 3:30 p. m., some ten miles off Rosario, a tailless, though energetic, individual was seen busily catching flies among the deck cargo.

The two Western Savannah Sparrows were not seen after 10:00 a. m., but the flycatcher and the yellowthroat remained on the steamer the rest of the day. September 28, at 8:00 a. m., off Magdalena Bay, another Western Savannah Sparrow came aboard, but stayed only two hours.

Turkey Buzzard (*Cathartes aura*). While lying off San José del Cabo, I could see, at most any time, twenty-five or more sailing about or sitting on the beach.

Yellow Warbler (*Dendroica aestiva*, subsp.?). Some twenty-five miles off San José del Cabo, at 2:00 p. m., one was seen. It was still on deck just before dark. The next morning the same bird, or a similar one, was seen.

Belted Kingfisher (*Ceryle alcyon*). Soon after daylight, September 30, some eight miles off Mazatlan, one flew past the steamer. On account of the steamer's crew going on a strike, we remained at Mazatlan five days.

Violet-green Swallow (*Tachycineta thalassina*). Many of these flew about the steamer as we were lying off the town of Mazatlan.

Black Vulture (*Coragyps urubu*). In sight constantly; often to be seen flying about with the Frigate Birds.

Western Lark Sparrow (*Chondestes grammacus strigatus*). On October 2, one visited the steamer for a few minutes.

American Duck Hawk (*Falco peregrinus anatum*). In the early morning of October 5, the steamer still in the harbor, I looked over the side of the vessel and saw a Mourning Dove sitting on the water. A few minutes later the hawk saw the dove, but was afraid to come so close to the steamer. It circled around twice and then disappeared. After the hawk was out of sight, the dove arose lightly from the water and flew safely to shore.

As we were passing Ceralvo Island, on the morning of October 6, a Yellowthroat (*Geothlypis trichas*, subsp.?) was seen aboard.—CHESTER C. LAMB, *La Paz, B. C., Mexico, November 11, 1928.*

Some New Records for Santa Barbara Island.—I spent November 11 and 12, 1928, on Santa Barbara Island, California, and noted the following species of birds not heretofore recorded for that island.

Eared Grebe (*Colymbus nigricollis californicus*). A single bird spent most of its time during the two days close to my boat which was anchored near some kelp. It frequently made short dives after small fish.

Pacific Loon (*Gavia pacifica*). A single bird spent much of its time close to the Eared Grebe and allowed of a close inspection of its characteristics.

Heermann Gull (*Larus heermanni*). A dozen or more of these distinctive gulls were seen.

Bonaparte Gull (*Larus philadelphia*). Quite a few of these small gulls, with the black ear patch, were in association with the larger gulls about the kelp.

Caspian Tern (*Sterna maxima*). Several individuals were seen as they flew rapidly over the kelp, and two were seen to dive after small fish.

California Great Blue Heron (*Ardea herodias hyperonca*). Two of these large herons were seen resting on the kelp.

Belted Kingfisher (*Ceryle alcyon*). A single bird was seen flying from the entrance of a large cave into which the waves entered to another similar cave where it perched on a rocky point and scanned the water below. It was not seen to dive.

Raven (*Corvus corax sinuatus*). Two ravens were noted. They have been doubtlessly attracted to the island by some recently imported sheep which are rapidly dying because of the absence of fresh water on this island. There will be plenty of wool for their nests next spring.—J. R. PEMBERTON, *Beverly Hills, California, November 26, 1928.*

Golden-crowned Sparrow without 'the Gold'.—Recently, while carrying on some bird banding work at Woodacre Lodge (formerly Mailliard Station, Rancho San Geronimo), Marin County, California, I captured an adult Golden-crowned Sparrow (*Zonotrichia coronata*) that was in the characteristic plumage of this species except that there was no trace of yellow upon the head. The median crown stripe was broad, absolutely gray and well defined between the very black lateral crown stripes, but with not even a tinge of yellow on any of the feathers composing it.

Not being able to call to mind any case of the total absence of yellow from the head of an adult bird of this species, I examined the Academy collection upon my return to San Francisco and therein found an adult female with the same absence of "gold" as in the above case. The Academy specimen, no. 19761, was taken in

Lake County, California, by an assistant in the Department of Ornithology of the Academy, on April 30, 1919. Evidently the bird was not critically examined at the time, or note would have been made of its peculiar marking. The fact that I have examined hundreds of birds of this species, as museum specimens, in field collecting and in banding operations, without having before noted an adult that did not have at least a little yellow on the head, makes it seem as if such cases as the two just mentioned are worth recording.—JOSEPH MAILLIARD, *California Academy of Sciences, San Francisco, California, October 31, 1923.*

Some Observations on the Feeding Habits of the Burrowing Owl.—Since early childhood the sight of one or more Burrowing Owls (*Speotyto cunicularia hypugaea*), suspended on fluttering wings in silhouette against the sunset sky of early summer evenings, has been a familiar sight to me. Sometimes, at a considerable elevation above the ground, they hover thus for some time, perhaps dropping to a lower level to hover again before the final descent to capture the prey observed from their vantage points. I have also known for years that, when the young are nearly full grown and are making great demands on the parents for food, the adults do considerable hunting in broad daylight.

Late in June, 1927, I had an opportunity to observe the daylight hunting of one parent of a hungry brood. Each week-day, about noon, I stopped to eat my lunch near a burrow inhabited by six nearly full-grown young. This burrow, the remodeled tenement of a ground squirrel, was on a small rise of ground at the edge of an alkali flat; and the mound of earth scratched out of it sloped down to this flat and was clear of weeds on the side toward me. The young owls were usually in a compact group on the highest part of the mound, while the adult, only one parent being observed, had several lookout stations, the nearest one being the top of a pile of baling wire and other junk on the alkali flat, and the others were fence posts at various distances from the burrow.

The usual program was as follows: The adult, frequently looking skyward, sighted some flying insect passing over, launched out in pursuit, climbing rather laboriously upward at a sharp angle and sometimes spirally, often to a height of 150 feet or more, and on overtaking the flying prey seized it with one foot. Then came a pause during which the prey was transferred to the beak, then a long glide, on set wings, directly to the nest. The young, on seeing the adult coming with food, rushed down the slope toward it, and then turned and rushed back as the adult passed over their heads to alight on the highest point of the mound. Then came a scuffle that would have done credit to a football game. However, actual possession of the coveted morsel seemed to be respected, and the lucky youngster was allowed to devour it at leisure. After a brief pause the adult returned to a vantage point to watch for more game.

This performance was observed many times, over a period of two weeks or more, with only slight variations in the sequence of events. The young are quite good runners and sometimes use their partly feathered wings to help them along. On one occasion the adult was seen to stop and feed a young one that had wandered about twenty feet from the burrow, and, after doing so, the old bird flew on to the mound before returning to the lookout. Once the adult flew at, and scolded, a ground squirrel that ventured too near the burrow; and several times it was itself annoyed by a California Shrike while on lookout. Once the adult seemed to miss the prey it was after, and an alarm note was sounded as it flew toward the burrow, whereupon the young did not rush to meet it as usual but dived into the burrow. No cause for this alarm could be seen.

During June, 1928, I had further opportunity to observe this method of hunting. A brood of four young in the same neighborhood was watched and more distant observations made of several other families in the same pasture. In this case both parents were engaged in feeding the young. The first case of "flycatching" was observed on June 9, and it continued until about the end of the month, when the young were scattered and learning to hunt their own prey. There was more variation, with this pair of birds, in the observation points used and in the technique of hunting. They were observed sometimes to transfer the prey to the beak while in the

air, and sometimes to retain it in the claws until the nest mound was reached when it was transferred to the beak before it was given to the young. These young did not seem so eager for the food, probably because in this case two adults provided for four young, instead of one adult providing for six young; but they were ever on the alert and would show by their actions that they could distinguish between the flights after prey and the occasional shifting of the adults from one vantage point to another. These adults sometimes captured prey on the ground as well as in the air. As the young grew older and learned to fly they sometimes flew toward and intercepted the adult before the burrow was reached; this was successful only in cases where the adult flew close to the ground after making a low, or a ground, capture. The adults sometimes ate the prey themselves, and in this case it was sometimes held up to the beak with one foot while the bird stood on its perch.

On one occasion a weasel appeared, crossing the pasture, and was immediately assaulted by the owls. The young were flying quite well at this time and they joined in the attack, hovering over the scurrying weasel and swooping at it from behind with extended claws. The weasel paused and faced them at times and then hurried on; I could not be sure that they actually struck him, but they came close enough to do so. Birds from other families joined the fun, and at one time there were ten owls in the air together. The weasel was escorted about one hundred yards before the chase was abandoned.

Even with the aid of 8-power binoculars I was unable to determine the nature of the winged prey, except that it consisted of insects of some kind. Examination of pellets from the burrow and various lookout stations showed them to be composed of the bones and fur of small mammals, legs and wing cases of several kinds of beetles, mandibles of Jerusalem crickets, and more or less sand and vegetable fibers; and of this assortment, the beetles seemed the only ones likely to be captured in the air. The remains of several crayfish were also found in the vicinity.—JOHN MCB. ROBERTSON, Buena Park, California, December 2, 1928.

EDITORIAL NOTES AND NEWS

FOURTH ANNUAL MEETING OF THE COOPER ORNITHOLOGICAL CLUB.—The widespread personal satisfaction and the stimulus to the cause that have resulted from the past three Annual Meetings of the Cooper Club have lead to the decision to hold a fourth meeting the coming spring. Informal conferences among certain members have resulted in the decision by Loye Miller, President of the Board of Governors, to hold this year's meeting in the San Francisco Bay region, on the dates May 17 to 19. The present notice may, therefore, be considered as a preliminary announcement, and further notices with respect to exact places for the meetings and nature of the program will be sent out in due time, through THE CONDOR or otherwise. President Miller has appointed the following committee-men, under the general chairmanship of Tracy I. Storer: program, H. S. Swarth; finance, J. Grinnell; hospitality, C. B. Las-

treto; halls, cinema facilities, etc., Alden Miller; printing and publicity, T. I. Storer. There are planned, in addition to the scientific programs, a dinner for Club members and their guests, local field trips and, probably, an exhibition of ornithological pictures. Call is now made upon each member of the Club, wheresoever located, to plan to attend in person, and to submit to Mr. Swarth title of such contribution to the program as he will find himself ready to present. It is none too early to begin arrangements for the occasion.

A retired business man, Mr. William H. Hoffstot, 14 East 55th Street Terrace, Kansas City, Missouri, has adopted as his hobby furtherance of popular activity in attracting wild birds. He has compiled, at his own expense, an explicit set of directions as to "How to Build a Bluebird House." Anyone applying to him, send-

ing a self-addressed, stamped envelope, will receive a copy of these instructions gratis.

A Cooper Club member of long standing, Edward Bruce Richards, died at Grass Valley, California, September 30, 1928. He was a mining man, born in Nevada City, May 21, 1872. Since retiring from active business, he had spent more and more of his time in the pursuit of bird study, and in so doing had gathered together a considerable collection of birds. Based on these, and upon his extensive local field experience, Richards published in *THE CONDOR*, XXVI, 1924, pp. 98-104, "A List of the Land Birds of the Grass Valley District, California", enumerating 114 species and subspecies. Shortly before his death, Mr. Richards presented his collection of Nevada County birds to the Museum of Vertebrate Zoology, University of California.

A book we have just read, of high literary as well as considerable natural history merit, is John C. Phillips's "A Sportsman's Scrapbook" (Houghton Mifflin, 1928). The illustrations, too, are excellent, the originals (by A. L. Ripley) nearly all of them done in what appears to have been lithographer's pencil, the half-tone results being soft and more like lithographs than reproductions from the usual types of drawings. Doctor Phillips inducts his reader skillfully into full sympathy with his own high type of sportsman's point of view, which lacks much of the prejudice and taboo characterizing the ordinary run of "fish and game" sportsmen. Geese, ducks and grouse, and trout, are dealt with in a pleasing, personal-remembrance style.—J. G.

The Marquis of Tavistock, in a communication to the *Ibis* for October, 1928 (pp. 817-818), sounds a warning that deserves to be repeated and emphasized. Speaking of plumage variability in broods of Pennant Parakeets that were raised in his aviaries, and in one brood in particular, his concluding statement is as follows: "Those Australian field naturalists who labour under the delusion that the Platycerci do not attain adult plumage with the first complete moult would probably, if shown the skins of my family of *P. elegans*, assign a different age, and possibly a different year, to each of them." Ornithological literature is full

of descriptions of plumage stages of the sort he justly criticizes based not upon observed differences in birds of known age, but purely upon the assumption that certain plumages are representative of certain ages, the very plumage thus described being then adduced as proof of the assumption. The fallibility of the latter method has been demonstrated several times, as in these parrots, and, from wild birds, in the Bohemian Waxwing. In dealing with captive birds, suggestive as observed variations may be, there is always the chance that behavior is not just the same as it would be in the wild, and this criticism would not arise in studies based upon banded birds. Here is a field in which bird banders can do good service by having the scope of their observations include more than manner of occurrence of some species at least, of the birds passing through their hands. Colonies of gulls, for example, thus studied might yield some valuable results.—H. S. SWARTH.

A PRIZE IN WESTERN ORNITHOLOGY

The Editors of *THE CONDOR* announce the Mailliard Prize of One Hundred Dollars, to be awarded in January, 1930, for the most worthy contribution to western ornithology to be submitted within the year 1929. Award of this honor will be subject to the following conditions.

The contribution is to consist of a written report (of not less than 1500 words), in language that is explicit but not necessarily technical, upon some phase of bird study carried on in western North America. Manuscript should be in the office of *THE CONDOR* not later than December 1, 1929, and it should be in a form suitable for publication in this magazine. Judgment will be rendered on the basis of originality in choice and treatment of the subject, thoroughness, accuracy of detail as it reflects accurate observation, and the significance of the results for general natural history.

Competition for this award is open to any student of ornithology in North America west of the Mississippi, whose membership in the Cooper Ornithological Club has begun not later than December 1, 1929; but excepting faculty members and students in the University of California, and members of the staffs of other institutions where ornithological work is already a prominent feature. It is the intention of the donor of this Prize, Mr.

Joseph Mailliard, of San Francisco, an Honorary Member of the Cooper Ornithological Club, thus to encourage persons who do not have ready access to large libraries or to extensive collections of specimens, to make independent, intensive studies of living birds.

Persons who expect to submit manuscripts should write for directions as to mechanical preparation of the papers to either of the Editors of *THE CONDOR*, J. Grinnell or J. M. Linsdale, Museum of Vertebrate Zoology, University of California, Berkeley, California.

THE MEETING OF THE AMERICAN ORNITHOLOGISTS' UNION AT CHARLESTON, S. C., NOVEMBER 20-22, 1928.—The selection of Charleston for the A. O. U. meeting of 1928 proved to be a decidedly happy choice, for the charms of southern hospitality, climate, and "atmosphere" combined to produce most felicitous results. Some doubts may have been felt as to a large attendance amid untried surroundings, but the Union has become bolder of late years in following new paths and the turn-out of members was all that could have been desired. Nearly everyone came, and nearly everyone brought his wife!

The California representatives (Mailliard, Miller and Swarth) were first to arrive, Sunday morning, followed at once by the Washington contingent, twenty-nine in number. Members of the local committee (Messrs. Williams, Sprunt, Sass and Simons) were on hand to greet arrivals at the hotel, and on Sunday afternoon they and their friends took everyone out for a drive through the city and in the surrounding country. Many additional arrivals toward evening added to the success of the informal "get-together" that from then on was in progress at all times not occupied by the formal sessions.

The meetings were held mostly in the Charleston Museum, where Miss Bragg, the Director, and her several assistants, were thoughtful and considerate hosts. The length of the program necessitated double sessions on two mornings, the technical papers being given in a smaller room while those of more general interest were delivered in the large auditorium. The "memorial session," Tuesday evening, was most appropriately held in St. John's Lutheran Church, memorable as the church where Bachman once was pastor. The session devoted to motion pictures was held in the Charleston High

School, on the site of Bachman's home.

An appreciated feature of the meeting was the abundant opportunity for everyone to see something of the surrounding country. Besides the hastily organized drives on Sunday, there was on Tuesday afternoon a motor trip fifteen or more miles from town, covering some of the collecting grounds of Catesby, Audubon and Garden, and taking in also the famous and beautiful Middleton Gardens. Then, the whole of Friday was devoted to a field trip by boats to Dewees Island, where members were the guests of Mr. and Mrs. C. D. Huyler at their attractive winter home. The western members of the party, at least, will long remember the sail over the placid waters of the bay and along the winding channels, and the walk through the unfamiliar woods of Dewees Island.

The annual dinner, with perhaps 200 present, was held in Hibernian Hall, in a huge, high-ceiled room with the chandeliers hung with ropes of smilax. The dinner was followed by a feature probably unique in the annals of the Union, an entertainment by a Charleston amateur musical organization, "The Society for the Preservation of Spirituals." The negro religious songs thus delivered were applauded by an appreciative audience, who could realize the historical and sentimental value attached to the preservation of this most charming and characteristic music.

Preliminary to the public sessions were the several business meetings, occupying Monday afternoon and lasting far into the night. One Fellow was elected, Arthur T. Wayne, of Mount Pleasant, on the outskirts of Charleston, the outstanding ornithologist of the southern states at the present time. It was a pleasing circumstance that permitted his election at this meeting, but it was a disappointment to the membership that Mr. Wayne was too ill to attend the sessions, or to meet anyone. Another local man, Alexander Sprunt, Jr., of the Charleston Museum, was elected Member. One new name was added to the Council, that of P. A. Taverner.

At this Meeting there were to be seen the familiar faces of most of those on whom the Union has depended for guidance during many years past. There was one, however, whose absence was keenly felt, Dr. Jonathan Dwight, prevented from attending by illness, and absent from an A. O. U. meeting for the first

time since he joined the society in 1886. Dr. T. S. Palmer, secretary, guide, courier—the Pooh-Bah of the organization—was here, there and everywhere, from the moment when he herded his Washington associates into the hotel, to the time when he saw them all safely embarked upon the departing busses. Indefatigable himself, he saw that others, too, were occupied. In clear, resonant tones he told us where to go and when; what tickets to buy, at what price, and what for; when the trains left, and where transportation could be arranged. Nor shall we soon forget the emphasis with which he urged—no, instructed—everyone to be sure to catch the earlier departing of the fleet of boats in which we made our field trip. No wonder that, when he, himself, strolled leisurely down to the wharf at the last minute to embark upon the largest, swiftest, and least crowded of the boats (the last one to leave the dock), an embittered member, bereft of his early morning sleep, hurled the epithet “Mussolini” after him!

The program of papers and talks was a long one. In fact there was expression of opinion from several people present that fifty-four papers was too many for all to receive the attention they were justified in demanding. A few contributions by absentees were necessarily omitted, but even so, though of the remainder none was markedly curtailed in length, nor were many discussions cut short, there was a feeling of hurry to keep up with the program, that, with the present writer, at least, militated against complete enjoyment of the subject matter presented. Such general comment and discussion as was evoked by Griscom's talk on “The Green Herons of the World,” and by Roberts' on “Changes in Distribution of Certain Birds in Minnesota during the Past Fifty Years,” are among the most valuable features of such a meeting, but there were not many cases where such supplementary remarks could be carried to any length.

“Popular” bird talks illustrated with excellent slides, and some with remarkably fine and instructive motion pictures, and an exhibition of bird paintings and drawings in one of the rooms of the Charleston Museum, were attractive to all, and held the attention of many who were not particularly drawn to technical discussions.

A surprisingly large number of those

in attendance remained in Charleston for most of the day following the formal close of the occasion, affording again opportunity for the social foregathering that is such an enjoyable and valued feature of the A. O. U. meetings. The Charleston meeting has passed into history, and the local committee and their collaborators may well feel content with the result of their efforts, and with the pleasure they gave to an appreciative assemblage of visitors.—H. S. SWARTH.

MINUTES OF COOPER CLUB MEETINGS

NORTHERN DIVISION

SEPTEMBER.—The September meeting of the Cooper Ornithological Club, Northern Division, was held on Thursday, September 27, 1928, at 8:00 p. m., in Room 101, Zoology Building, University of California, with about 100 members and guests present. In the absence of president and vice-president Mrs. Amelia S. Allen occupied the chair. Minutes of the Northern Division for August were read and approved. The following applications for membership were read: Prof. S. F. Light, Department of Zoology, University of California, Berkeley, proposed by Alden Miller; Mr. Vaughan MacCaughey, 508 Sheldon Bldg., 461 Market St., San Francisco, proposed by J. Grinnell; Mr. A. L. Pickens, Room 216, Zoology Building, University of California, Berkeley, proposed by Alden Miller.

Mrs. G. E. Kelly reported that on September 16 a group of Audubon Association members including herself saw two Pectoral Sandpipers on the edge of a fresh-water pool near Baumberg, Alameda County. Even though these birds were not taken, the opportunity for observation was so excellent that the group of observers felt certain of the identity of the birds. Two encouraging reports on the status of the California Clapper Rail were given, Mr. Swarth having observed an individual several times during the past month in the tall marsh grass which has become established along the Key Route fill, and Mrs. Kelly adding that she had recently seen six birds of this species near Dumbarton Bridge. Mrs. Mead saw a Wandering Tattler during the first week of September when visiting the edge of the bay near the ship yards to study Phalaropes. Mrs. Blake reported that two weeks ago she had seen

Gambel White-crowned Sparrows on her home place and the first Ruby-crowned Kinglet on September 27. Mr. Laidlaw Williams contributed the following notes on the birds of Strawberry Canyon, Berkeley: Black-throated Gray Warblers were noted there on September 7, 8 and 15; on the 19th, the first Audubon Warbler of the season was observed, and the Fox Sparrow and the Hermit Warbler were seen on the 20th.

The talk of the evening was given by Mr. A. L. Pickens, of South Carolina, who spoke upon the "Relation of hummingbirds to form and color in flowers," detailing his experiences in the eastern states. According to his observations hummingbirds visit only or chiefly flowers of a yellow, orange, red or purple classification in the color scale, and certain plants, as *Macranthera* of the Mississippi swamps, are dependent on these birds for fertilization. Mr. Pickens' talk was well illustrated by blackboard drawings in colored chalks. The problem chosen for study by Mr. Pickens proved of much interest to his hearers who were charmed by his manner of presenting it as well as by the actual subject matter of his discourse.—HILDA W. GRINNELL, *Secretary*.

OCTOBER.—The regular monthly meeting of the Northern Division of the Cooper Ornithological Club was held on October 25, 1928, at 8:00 p. m., in Room 101, Zoology Building, University of California, Berkeley, with President Bassett in the chair and about sixty members and visitors present. Minutes of the Northern and Southern Divisions for September were read by title. The following names were proposed for membership in the Club: Mr. Harlan B. Hess, Morrill, Nebraska, proposed by Junius Henderson; Miss Leigh M. Larson, 2329 Prospect Street, Berkeley, Calif., by Edna M. Fisher; Miss Inez Meader, 830 McKinley Ave., Oakland, Calif., by C. A. Harwell; Ignatius McGuire, 209 Guyot Hall, Princeton University, Princeton, New Jersey, by H. S. Swarth; Mrs. Jean M. Nelson, 2920 Benvenue Ave., Berkeley, Calif., by H. S. Swarth; Miss Mary F. Sanford, 2212 Santa Clara Ave., Alameda, by Margaret W. Wythe; Francis H. Sumner, 5218 17th Ave., N. E., Seattle, Washington, by R. C. Miller.

Mr. Grinnell suggested that interested members secure from the Division of Fish and Game copies of an excellent bulletin

upon the Owls of California, written by Donald McLean. Mr. Swarth called the attention of book lovers to the fact that copies of a popular edition of Wm. Beebe's monograph of the Pheasants may now be secured from an eastern book dealer for \$5.50. Mrs. Bailey's forthcoming "Birds of New Mexico" was discussed by Mrs. Kelly who stressed the facts that this most desirable book is being published in a limited edition and sold at cost. Those present were invited to look over a set of the twenty-five beautiful colored plates, one by Fuertes and the rest by Major Brooks, which are to appear in Mrs. Bailey's book.

Observations by members were as follows: Mr. Clark P. Streator reported that this year Robins were present at Santa Cruz during June and July, and he thought they were nesting there. A Mockingbird had come as usual to spend the fall months about his fig tree, arriving October 14. Mrs. Kelly reported seeing a European Widgeon at Lake Merritt on October 12. Mr. Bassett reported the return of two Golden-crowned Sparrows banded by him last winter. Mr. Clabaugh spoke of a Fox Sparrow which had returned to his trap for three successive winters. Mr. Laidlaw Williams reported having seen a Mockingbird in Alameda on October 3, a Black Rail and twelve Clapper Rails on the same day near the Dumbarton bridge, on the Redwood City side. In Strawberry Canyon he had seen a Varied Thrush and a Ruby-crowned Kinglet on October 12, and a Winter Wren and a late Tolmie Warbler on October 14.

The speaker of the evening was Mr. Vaughan MacCaughy, whose topic was "Avifaunal Zones and Habitats in the Hawaiian Archipelago", illustrated by a series of excellent slides. Mr. MacCaughy's deep interest in the natural history of the Islands and his long residence there have given him a fund of knowledge which made his talk intensely interesting.

Adjourned.—HILDA W. GRINNELL, *Secretary*.

NOVEMBER.—The regular monthly meeting of the Northern Division of the Cooper Ornithological Club was held on November 22, 1928, in Room 101, Zoology Building, University of California, Berkeley, at 8:00 p. m., with sixty-five members and guests present. Vice-president Clabaugh presided. October minutes were

read by title. Discussion was opened on the question of nominating a State Bird, and Mr. Brighton C. Cain presented a form of ballot successfully used in local schools. Mr. Harwell stated that through the interest of the Audubon Association of the Pacific station K G O is now broadcasting information relative to the campaign. Mr. H. C. Bryant stated that through the efforts of Mrs. F. T. Bicknell the campaign in southern California is endeavoring to exclude game birds from the list of candidates for State Bird, a condition which seemed to members of the Northern Division unfortunate.

Mr. C. A. Bryant reported seeing Western Blue-gray Gnatcatchers at Rodeo Lagoon on November 18, and Short-billed Gulls near Manzanita the same day. On the same date Mr. Cain picked up a dead Short-billed Gull on the shore of Lake Merritt. Mr. E. Raymond Hall reported on the wholesale shooting of several species of geese near Willows and Colusa by means of live decoys. Mr. H. C. Bryant said that it is hoped that a bill preventing the use of live decoys will pass the next State Legislature. Miss Selma Werner reported having seen a Surf-bird feeding on the rocks near Land's End.

Mr. H. C. Bryant spoke most entertainingly upon "Some Birds of Western National Parks" and added comments on the larger mammals and upon the geology of the regions which he visited, closing his talk with a few words upon the place of educational work in the program of National Parks.

Mr. Charles A. Bryant described "Some Autumn Birds of the Grand Canyon" as noted on a vacation trip, and his account of the 54 species of birds seen about Hotel El Tovar and Phantom Ranch, as well as along Bright Angel Creek, showed his keen powers of observation and gave much pleasure to his audience.

Adjourned.—HILDA W. GRINNELL, *Secretary*.

SOUTHERN DIVISION

OCTOBER.—The Southern Division of the Cooper Ornithological Club held its monthly meeting at the Los Angeles Museum, Exposition Park, Los Angeles, on October 30, 1928, at 8 p m., with 25 members and guests present and President W. Lee Chambers presiding. J. R. Pemberton acted as secretary in the absence of the regular secretary. No minutes were read nor was any old or

new business brought before the Club.

The following applications for membership were read: S. Paul Jones, 509 West Avenue, North, Waukesha, Wis.; Herbert N. McCoy, 2537 Fifth Ave., Los Angeles, Calif.; Bayard H. Christy, 403 Frederick Ave., Sewickley, Pa.; R. Holtby Myers, 740 S. Spring St., Los Angeles, Calif.; Frank E. Morse, 162 Boylston St., Boston, Mass.; Arlie William Schorger, 2021 Kendall Ave., Madison, Wis.; Mrs. Mena Vestal French, Box 171, Wayland, Mass.; Cyrenius A. Newcomb, Jr., "The Junipers," Bloomfield Hills, R. 3, Pontiac, Mich.; William Gilbert Fargo, 506 Union St., Jackson, Mich.; all these proposed by W. Lee Chambers; Miss Elizabeth D. Crow, 354 Union Place, Los Angeles, Calif., proposed by George Willett; Lloyd Glenn Ingles, 515 C. St., Bakersfield, Calif., proposed by Wright M. Pierce; and Mrs. Willis Warner Brown, 4037 Alameda Drive, San Diego, Calif., proposed by Laurence M. Huey.

Dr. Bull of the Los Angeles Museum exhibited a few old coins, some of which dated as far back as 500 B. C., and upon which birds had been figured. He explained the use of the eagle on the earliest coins as an emblem of power, and the use of owls later on, in coins from Athens. He requested that Club members loan or donate such coins as they might have on which birds are depicted, in order that a movement which he has on foot to instill interest in children in the use of birds on coins be advanced.

Dr. Miller reported that a letter had been received from the Associated Sportsmen's Clubs of California requesting the Cooper Club to join in their movement which seems to be the creation and protection of breeding and shooting grounds for game birds in California. No action was taken on this because of lack of information.

George Willett gave a talk illustrated with lantern slides on Laysan Island as he found it in 1912 and 1913. He related the ornithological history of the island and explained the changes which have come to pass there through the destruction of all vegetation and the accompanying encroachment of wind-blown dune sand, all brought about through the introduction of rabbits. Following this, Mr. Willett placed on exhibition a fine collection of skins of some of the more striking and brilliantly plumaged birds of Costa Rica and Colombia. Adjourned.—J. R. PEMBERTON, *Secretary pro tem*.

